1° DAW
Computer systems

Unit 3

Installation of free and proprietary operating systems

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1. Pre-installation considerations

1. Hardware requirements
- Architecture: 32 bits (x86) or 64 bits (x64)
- Hard disk space (Minimum and recommended GBs)
- RAM memory (Minimum and recommended GBs)
- Processor (Minimum and recommended GHz)
- Graphics
- Installation media (CD, USB, network, etc.)

**2. Planning before installing**
- **Hardware:**
  - Drivers support
  - Compatibility
  - Support for all software applications: backup, databases, etc.
- **Operating systems:**
  - Hardware and drivers compatibility.
  - Efficient resources management
- **Applications:** Make sure the software you have is compatible

1. Pre-installation considerations

3. Preparing disk partitions

Hard disk physical structure

- Head
- Tracks
- Cylinder
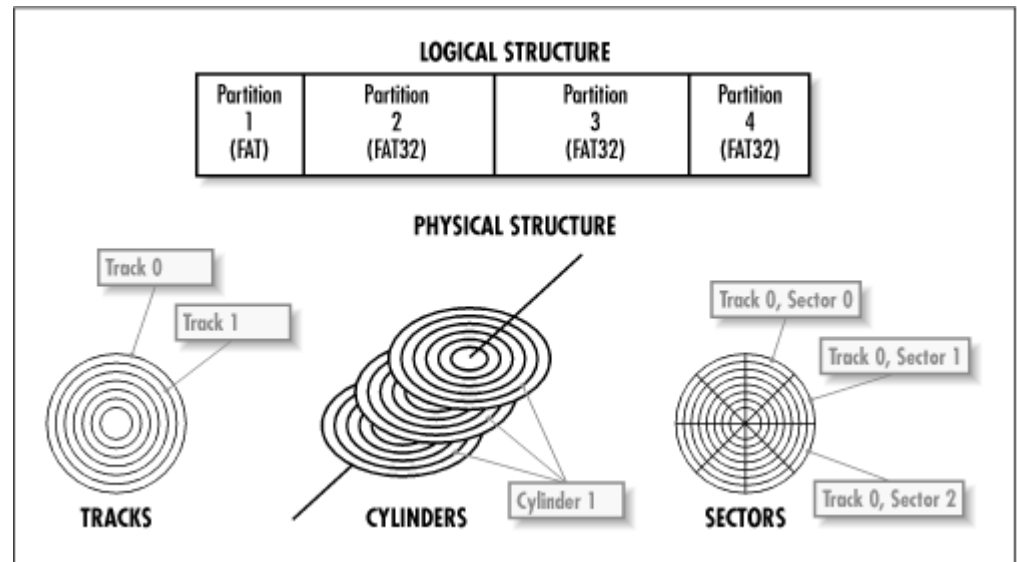- Sectors
- Clusters

Hard disk logical structure
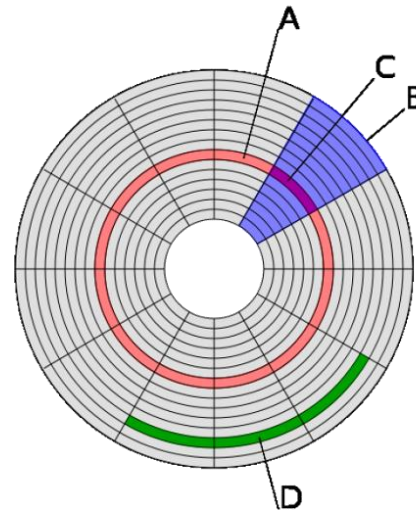
- Partitions

Hard Drive Structure:

A = track
B = sector
C = sector of a track
D = cluster

LOGICAL STRUCTURE

Partition 1 (FAT)	Partition 2 (FAT32)	Partition 3 (FAT32)	Partition 4 (FAT32)

PHYSICAL STRUCTURE

Track 0
Track 1

TRACKS

Cylinder 1

CYLINDERS

Track 0, Sector 0
Track 0, Sector 1
Track 0, Sector 2

SECTORS
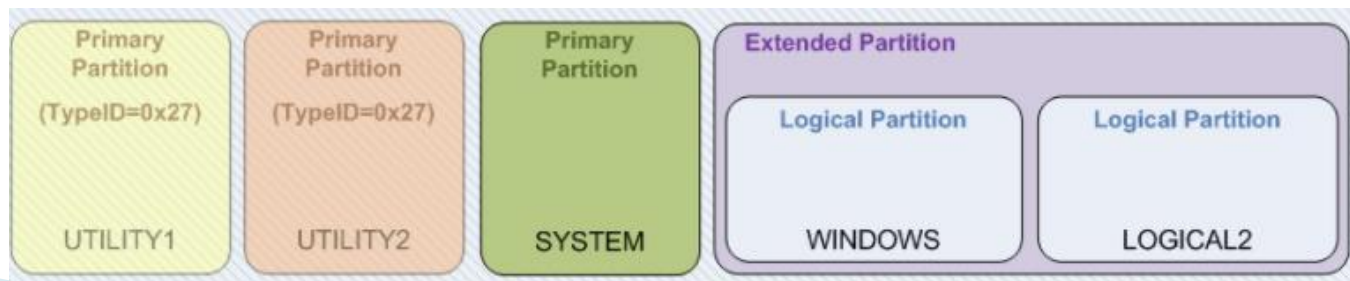
1. Pre-installation considerations

Disk partitioning is the creation of one or more regions on a hard disk or other secondary storage, so that an operating system can manage information in each region separately.
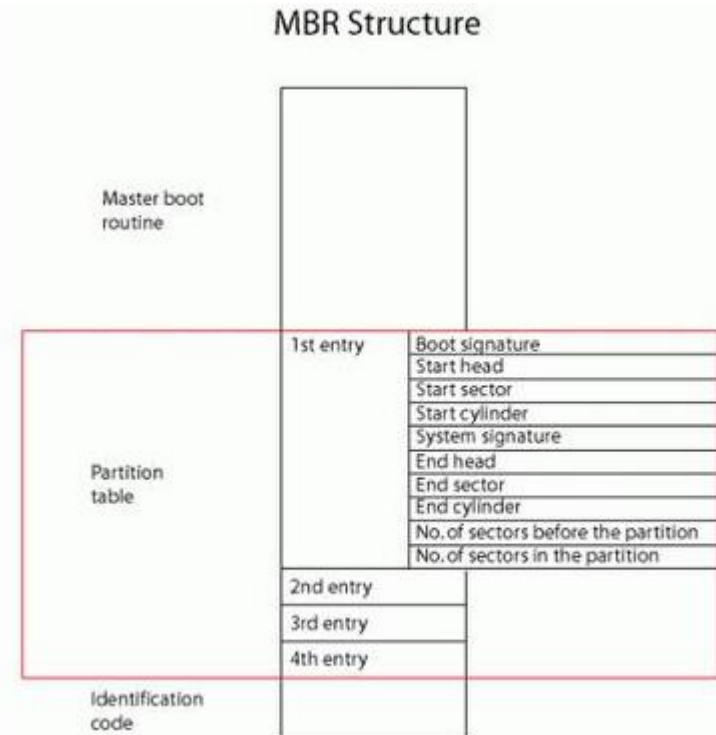
- Primary Partition is where both the OS and other data can be stored, and it is the only partition that can be set **active**. Whichever primary partition from which you load your OS at boot time becomes the active partition. You can designate only one partition active at a time.
- Extended Partition is a work–around used to extend the original method of partitioning a disk which only allowed dividing a disk into a maximum of four partitions. The extended partition can be subdivided into multiple logical partitions.
- Logical Partition is the hard disk partition created in extended partition. Like primary partition, a logical partition can be used to install an OS and any other types of files, but we are unable to set it active.

Primary Partition (TypeID=0x27)	Primary Partition (TypeID=0x27)	Primary Partition	Extended Partition	
			Logical Partition	Logical Partition
UTILITY1	UTILITY2	SYSTEM	WINDOWS	LOGICAL2

1. Pre-installation considerations

Partition table can describe the partitions on disk. If the disk partition table is lost, users are unable to read disk data and write new data on it.

- **MBR** partitioning is limited to a maximum of 4 partitions. But, many people want to create more than 4 partitions. So the <u>extended partition</u> is introduced for this demand.

- **GPT** is a standard for the layout of the partition table on a physical hard disk, using globally unique identifies. It allows users to create up to 128 partitions on hard disk. And it supports 18EB volume, while MBR supports 2TB volume. The <u>extended partition is not necessary using this partition table</u>.

MBR Structure

Master boot routine		
Partition table	1st entry	Boot signature
		Start head
		Start sector
		Start cylinder
		System signature
		End head
		End sector
		End cylinder
		No. of sectors before the partition
		No. of sectors in the partition
	2nd entry	
	3rd entry	
	4th entry	
Identification code		

1. Pre-installation considerations

File systems are a way of storing data inside the partitions in a way that is easy to manage and read and write data to it. A partition entry in the partition table will need a partition type (associated with file systems) to help the Operating System know how to handle the partition. For example: NTFS and FAT32 for Windows or EXT3 and EXT4 for Linux.

So… to install an operating system we have to:
- Partition hard disk, either to use all the space or only a partition.
- Format the partition with a file system compatibly with the OS.
- Install the OS in the partition selected

- We do not usually install the OS in an unique partition of the hard disk. We should reserve space for data or other operating systems.

2. Installation and configuration of Windows 10

▸ Select your language (English), time and currency format (Spanish), and keyboard layout (Spain).

2. Installation and configuration of Windows 10

- Install or repair
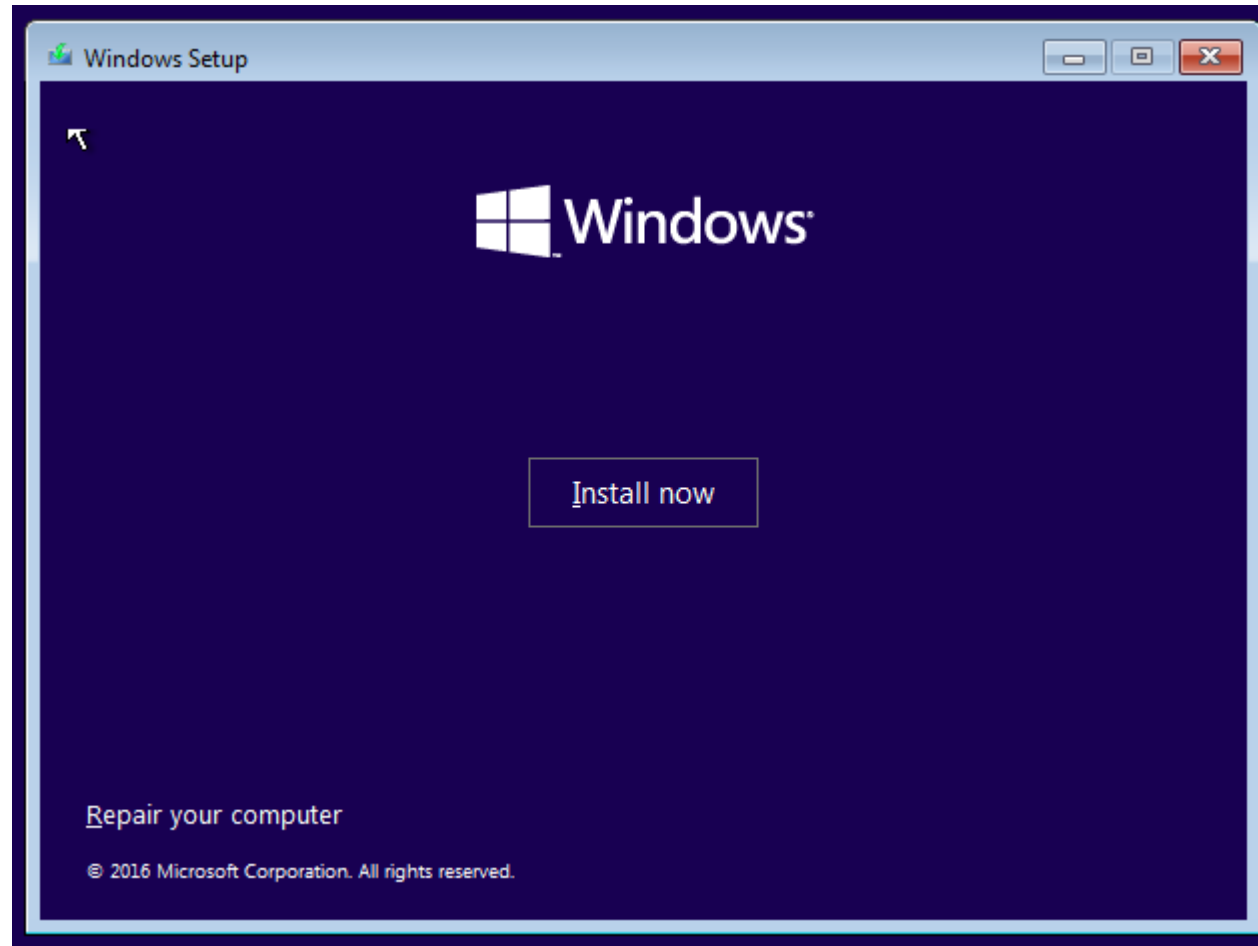
2. Installation and configuration of Windows 10

- Activate Windows screen
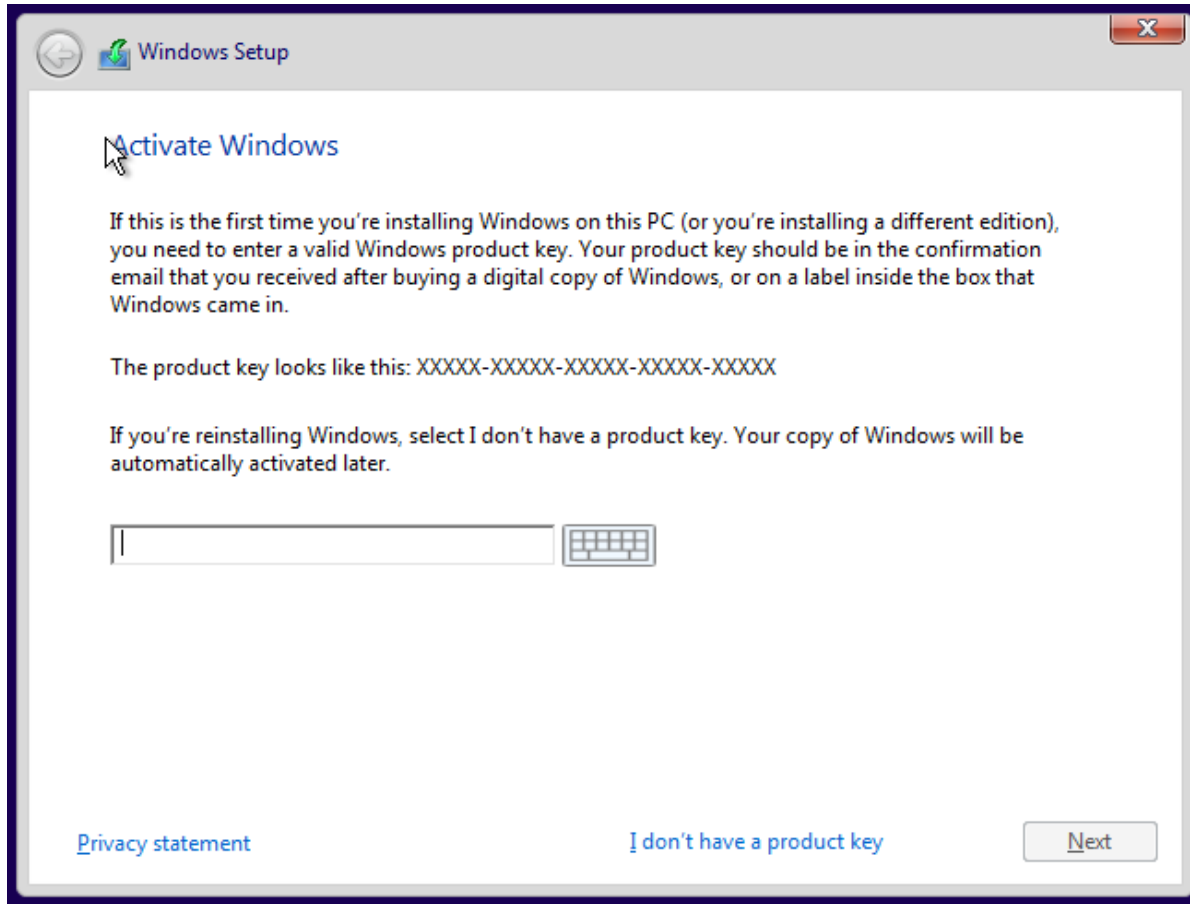
If you skip this step, some features will not work after a limited amount of time

2. Installation and configuration of Windows 10

- Select your version (here we are going to install Windows Pro)
- Windows 10 Home vs Pro:
  http://gadgets.ndtv.com/laptops/features/windows-10-home-vs-windows-10-pro-differences-new-features-718532
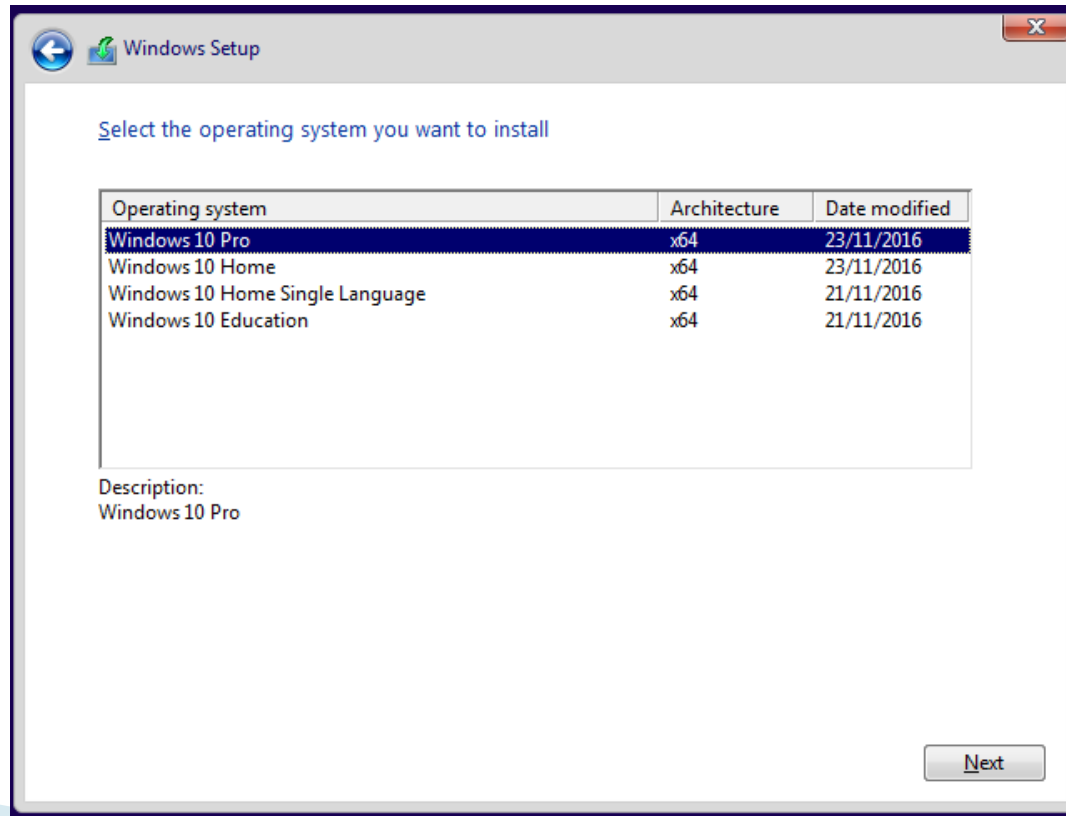
2. Installation and configuration of Windows 10

▸ Read and accept license terms (nobody reads it, but it is really important)
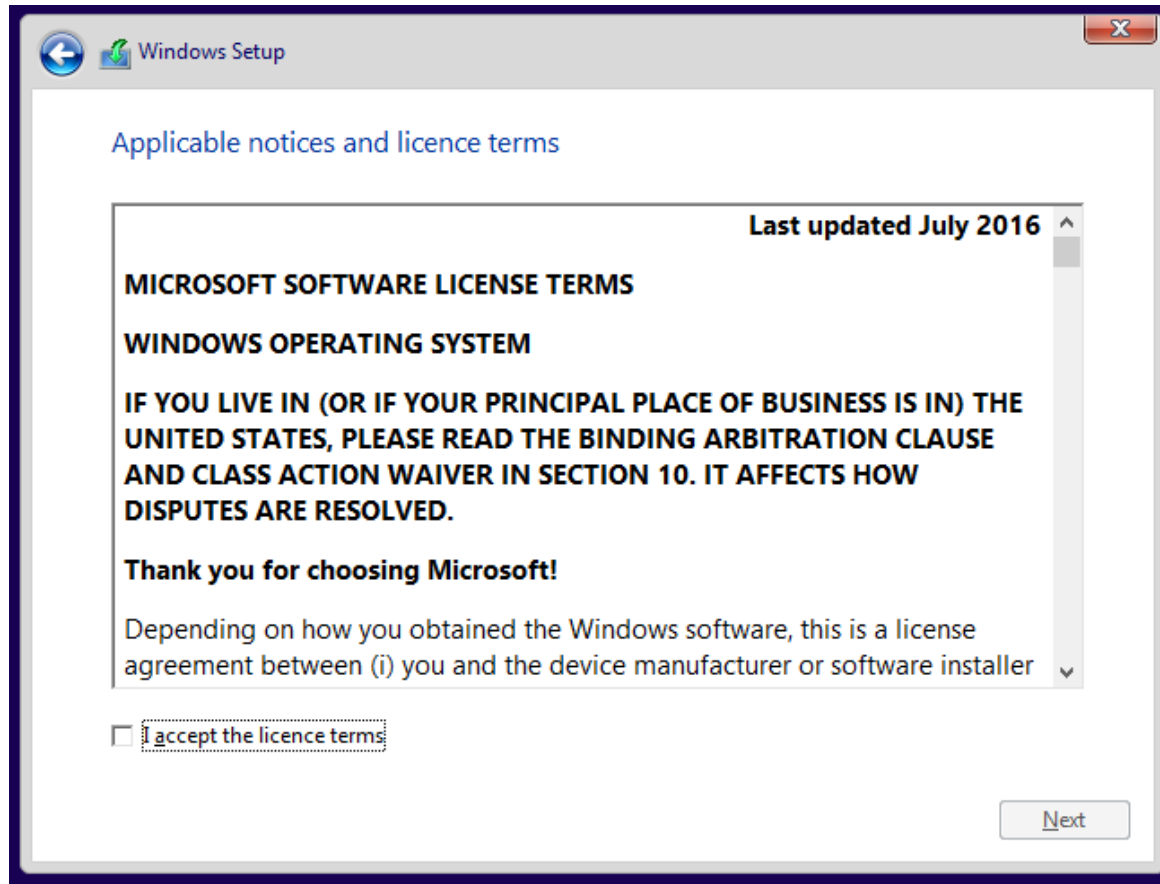
2. Installation and configuration of Windows 10

▸ **Upgrade or custom:** "Custom" to perform a clean installation and remove everything on your PC
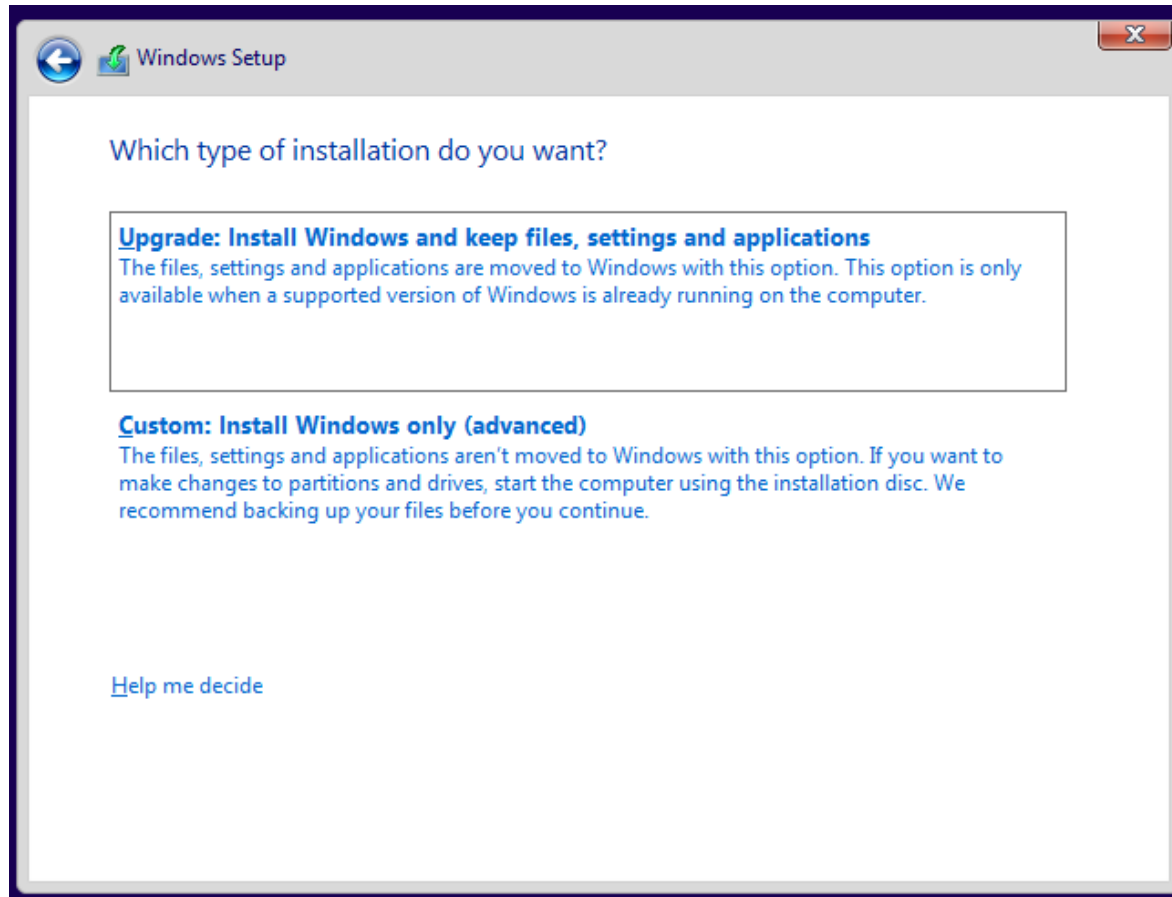
2. Installation and configuration of Windows 10

▸ Partition table. Click "New" if we want to create a partition smaller than default and let free space on the hard disk
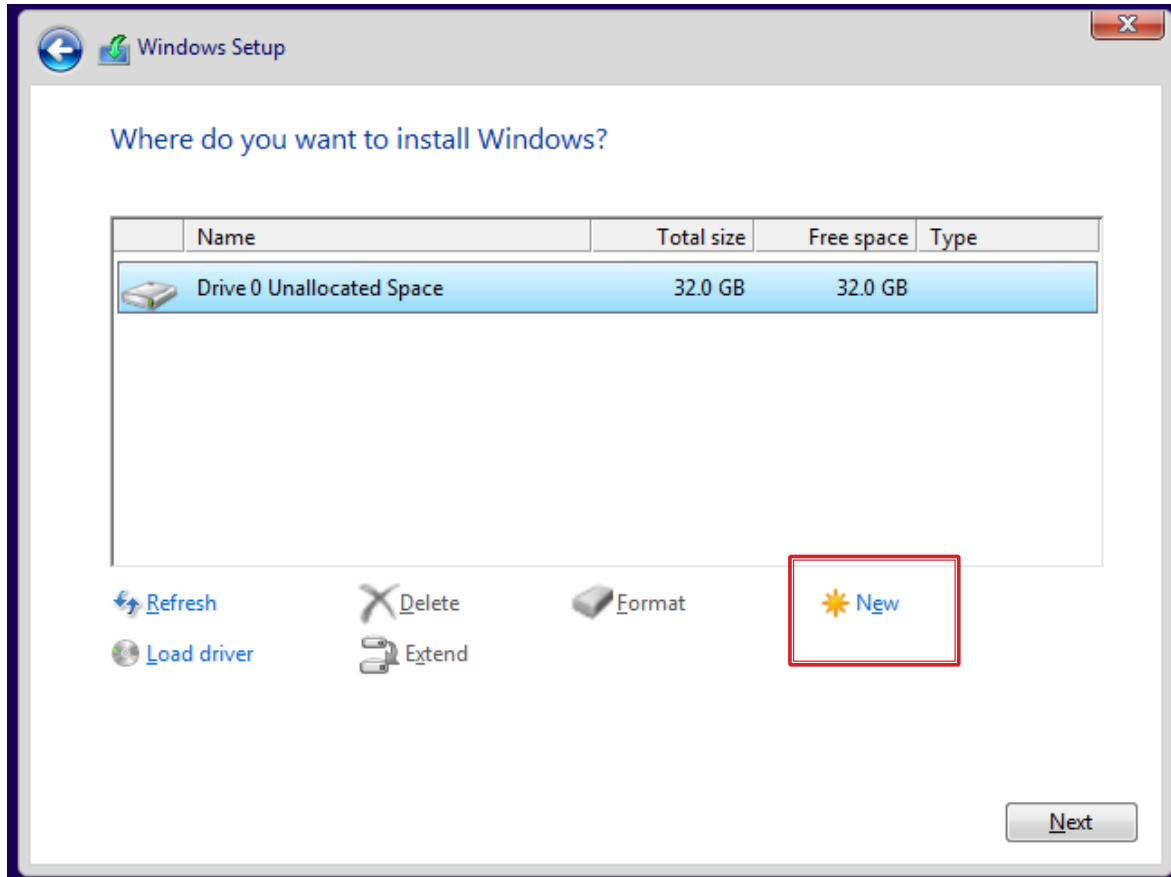
2. Installation and configuration of Windows 10

▸ Partition table. We get the following alert if we create a partition (in MB, so, for example 20 GB = 20480 MB)
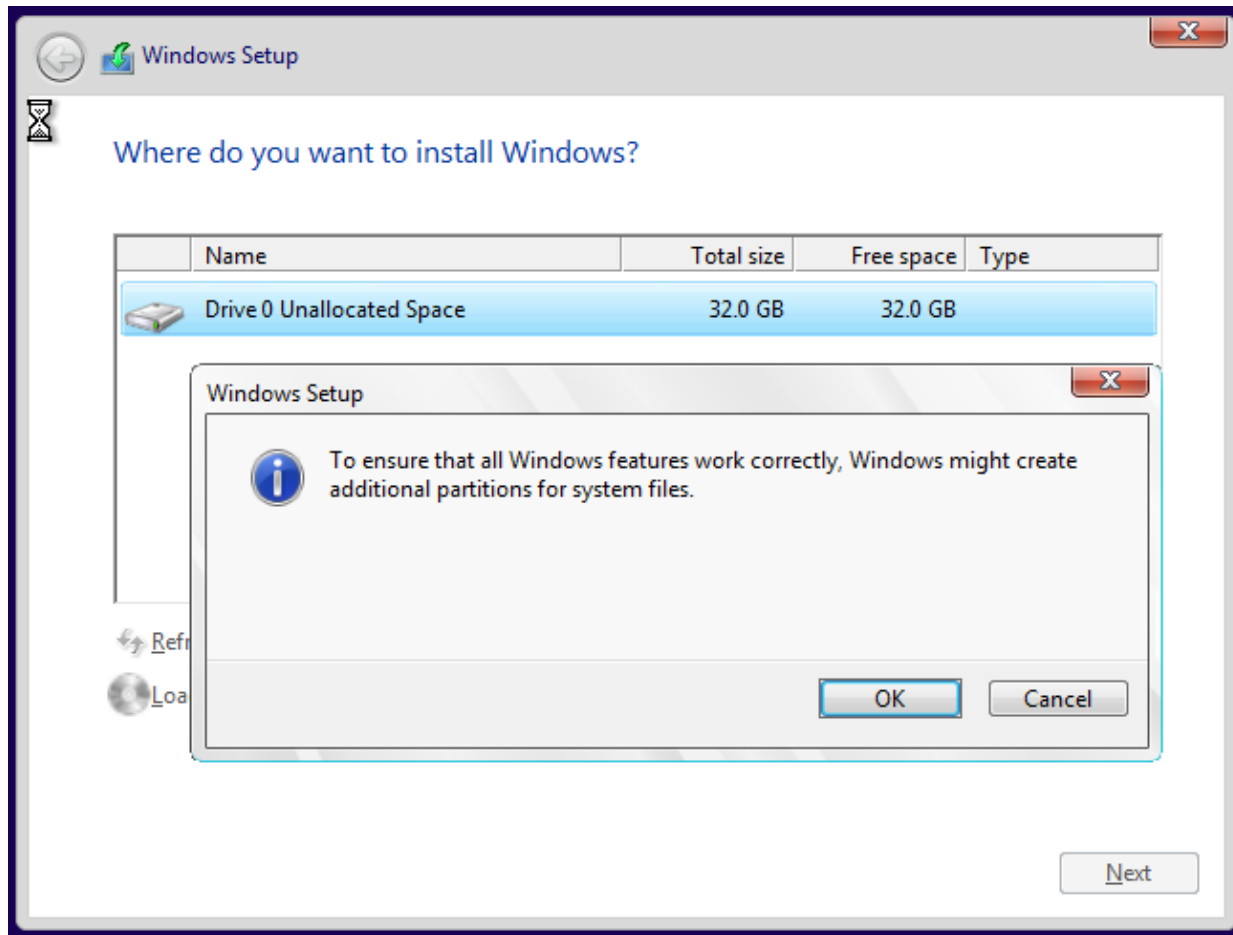
2. Installation and configuration of Windows 10

▸ Partition table. Windows 10 always creates additional partitions (one for the bootloader and other for the system), even if we skip the previous step and we use all the disk space for the operating system.
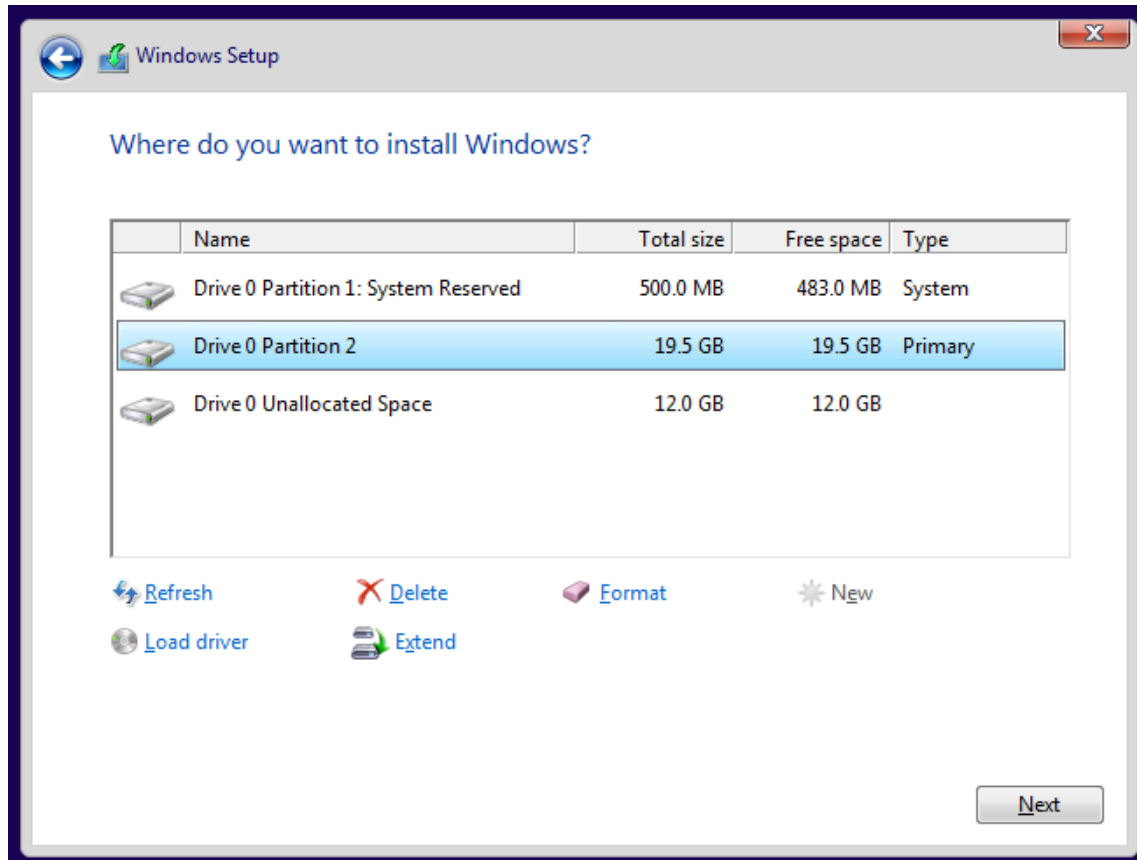
2. Installation and configuration of Windows 10

▸ Partition table. We can format (delete all files) or extend (increase the size) other existing partitions
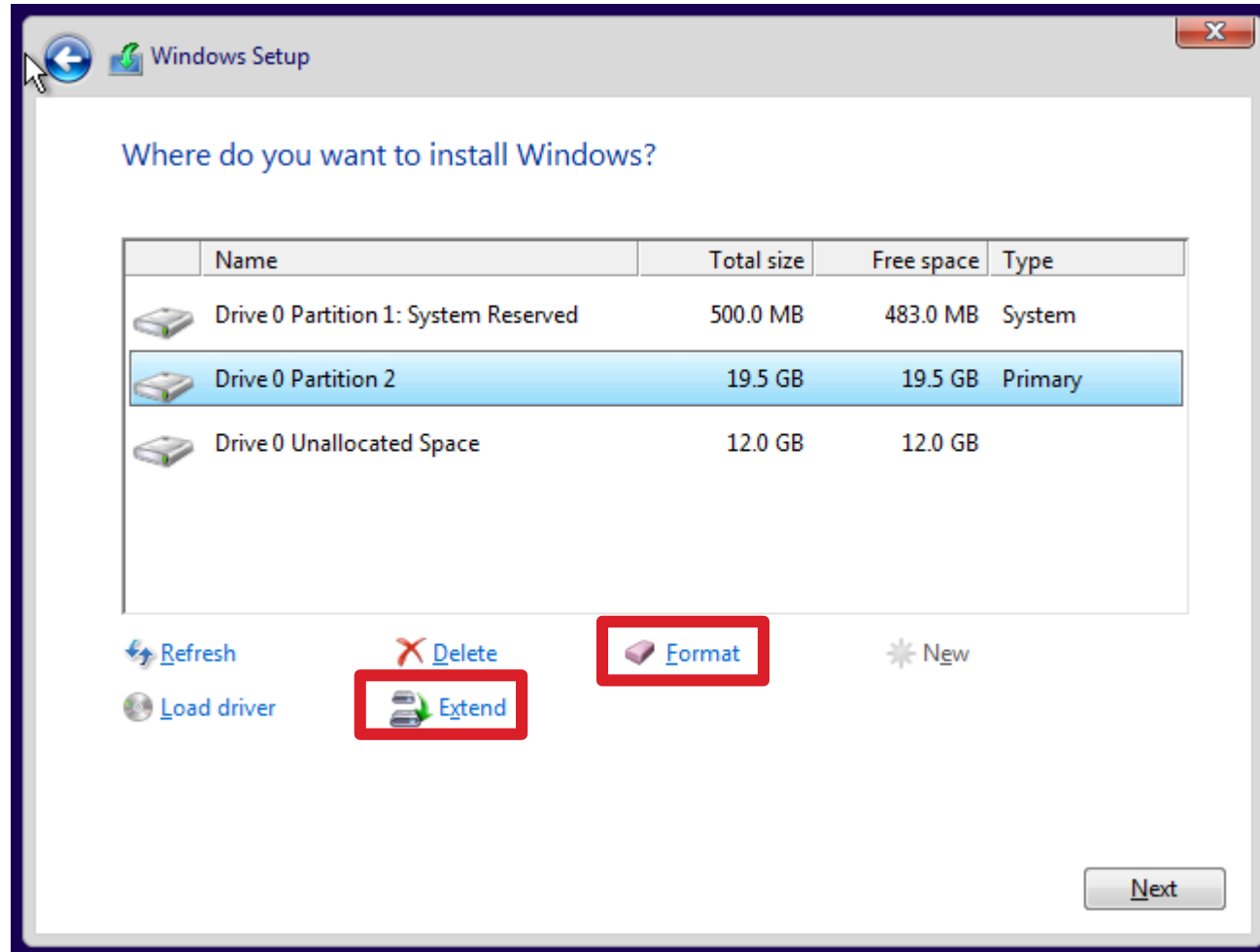
2. Installation and configuration of Windows 10

▸ Installing…
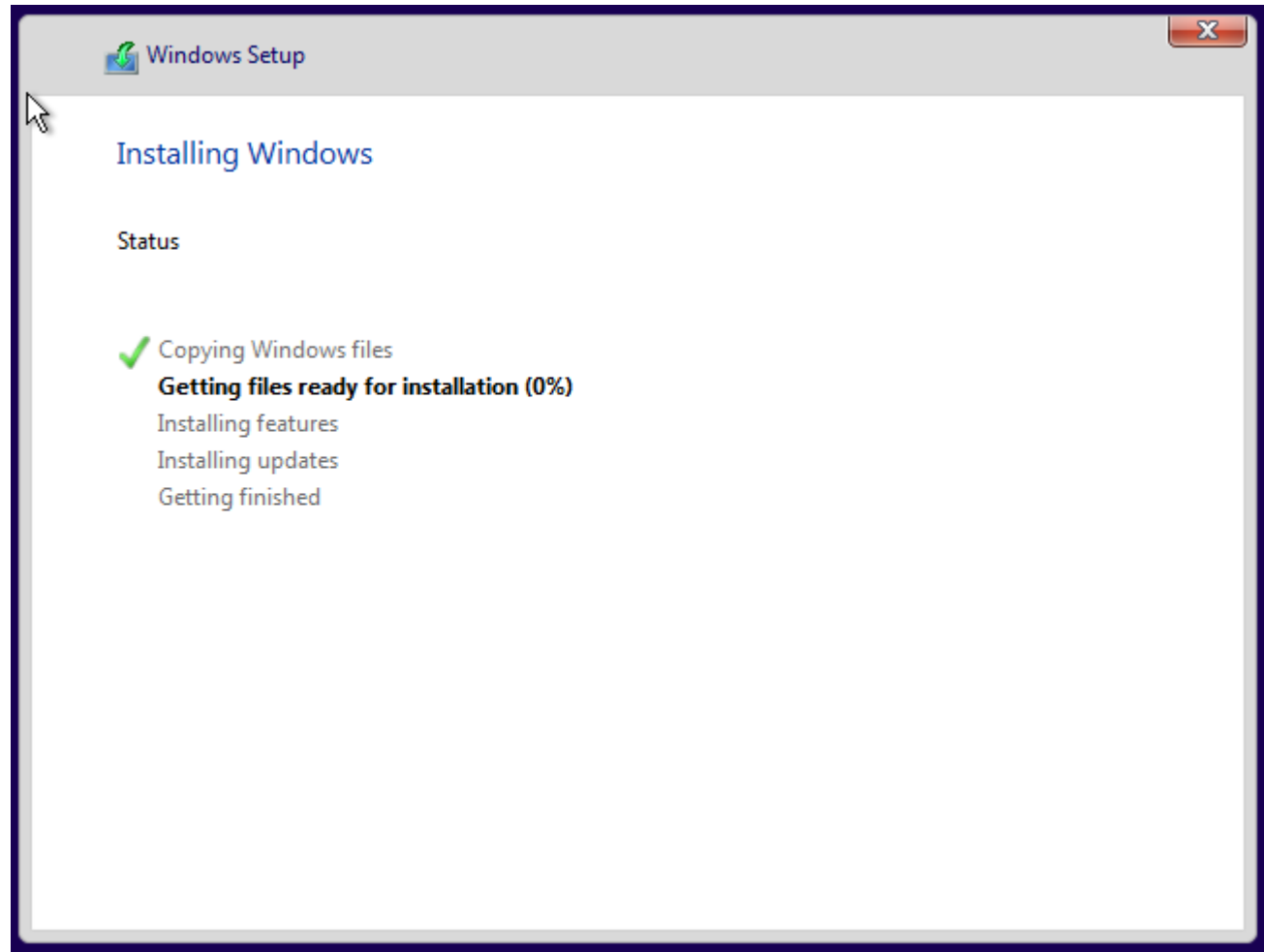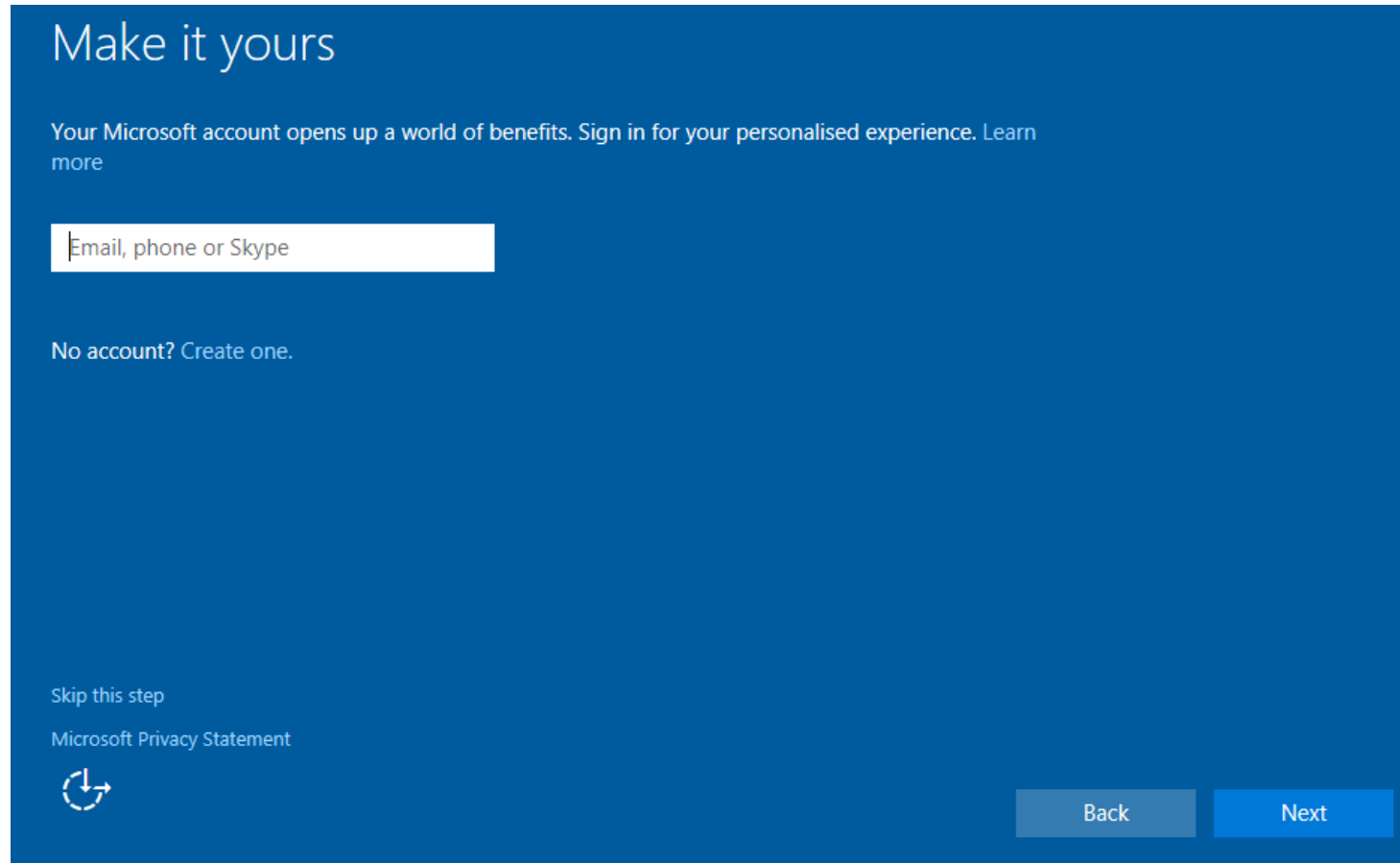
2. Installation and configuration of Windows 10

- System configuration: Customize or Express settings
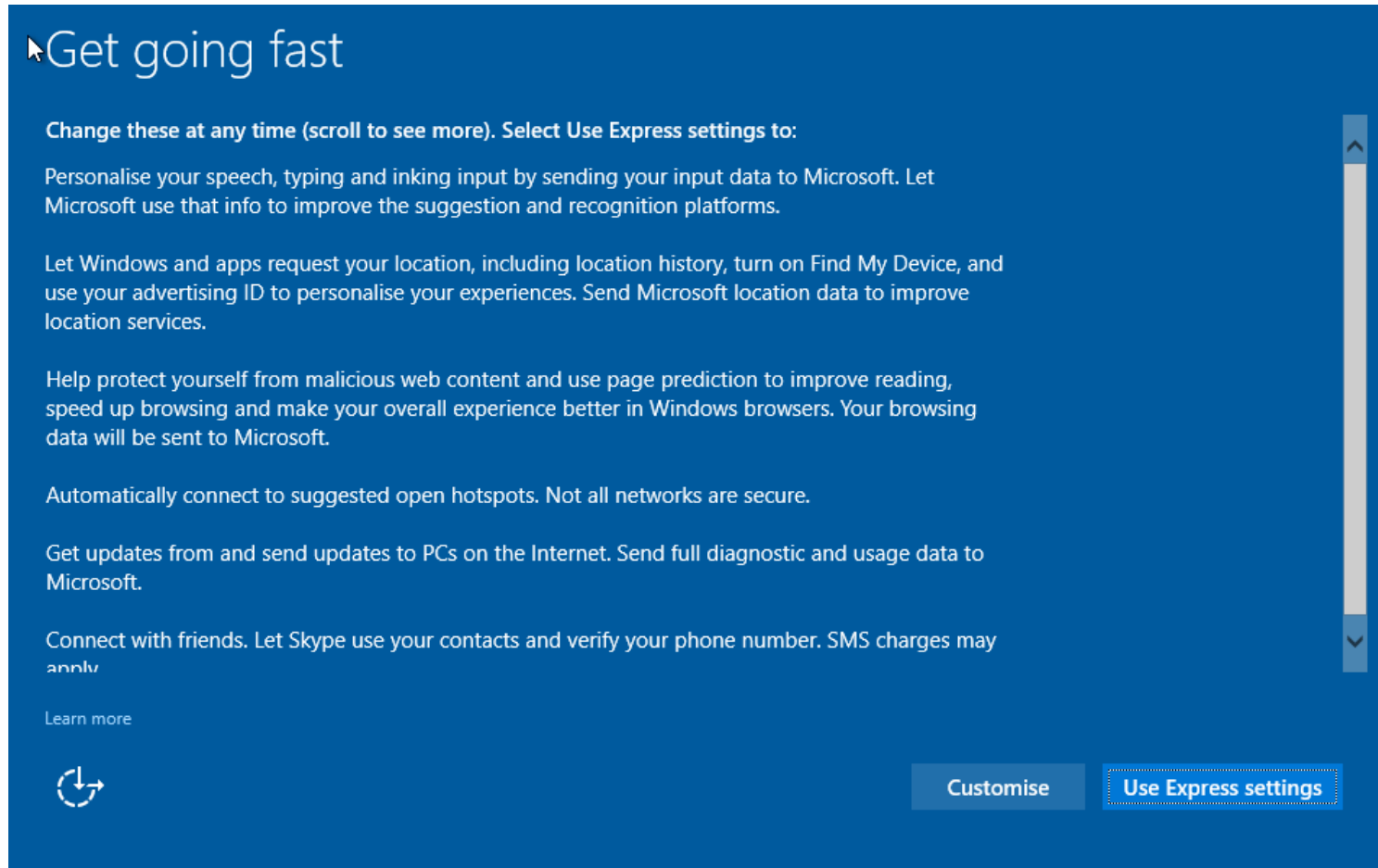
2. Installation and configuration of Windows 10

▸ System configuration: Microsoft account

2. Installation and configuration of Windows 10

▸ System configuration: user and PC name

Create an account for this PC

If you want to use a password, choose something that will be easy for you to remember but hard for others to guess.

Who's going to use this PC?

Username

Make it secure.

Enter password

Re-enter password

Password hint

Back   Next

3. Installation and configuration of Ubuntu 19.04

▸ Select language and Install Ubuntu. <u>In English</u>
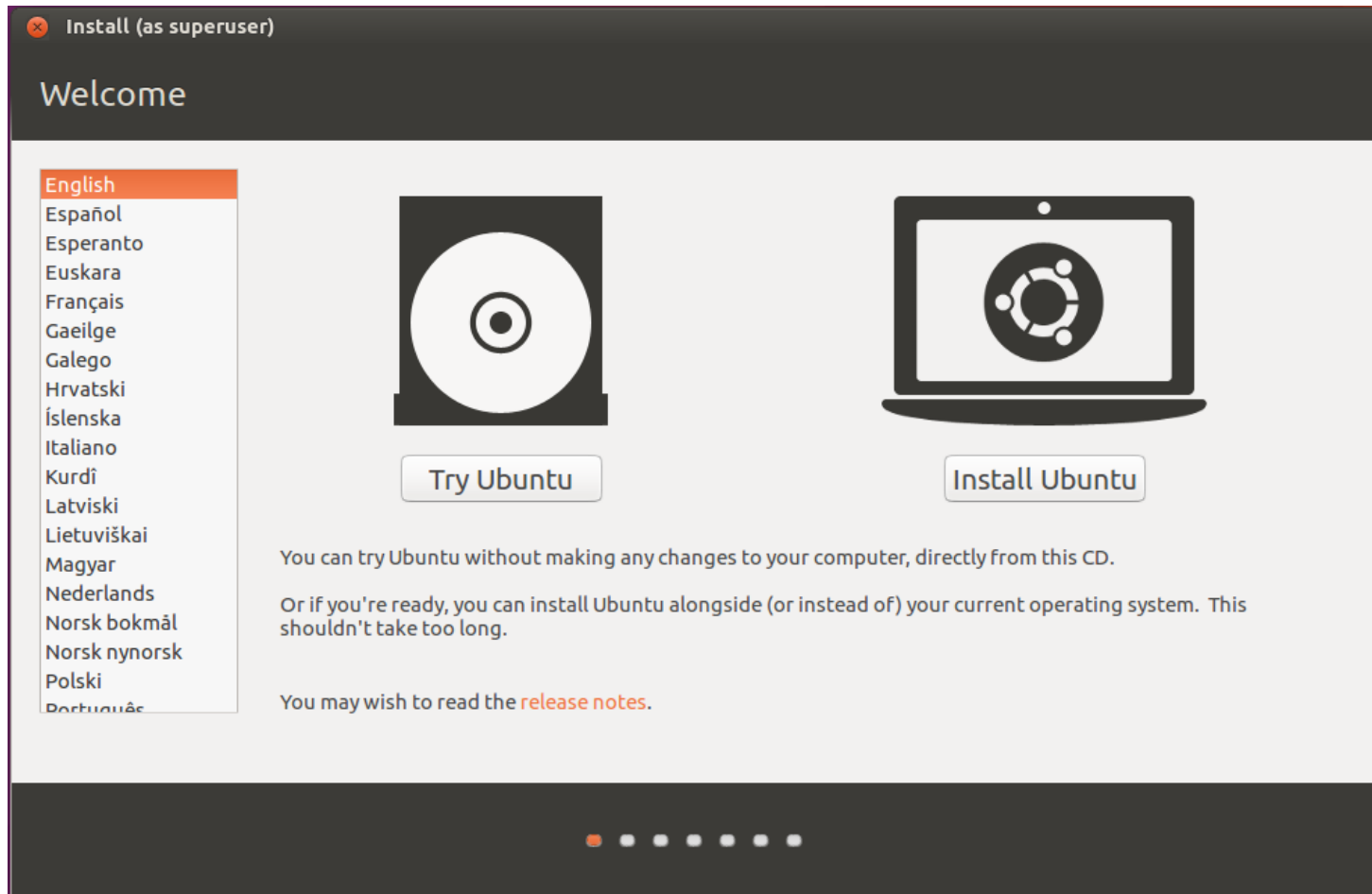
3. Installation and configuration of Ubuntu 19.04

▸ Select keyboard layout. IMPORTANT: <u>In Spanish</u>

Install (as superuser)

Keyboard layout

Choose your keyboard layout:

Romanian	**Spanish**
Russian	Spanish - Asturian (Spain, with bottom-dot H and bottom-dot L)
Serbian	Spanish - Catalan (Spain, with middle-dot L)
Sinhala (phonetic)	Spanish - Spanish (Dvorak)
Slovak	Spanish - Spanish (Macintosh)
Slovenian	Spanish - Spanish (Sun dead keys)
Spanish	Spanish - Spanish (Winkeys)
Spanish (Latin American)	Spanish - Spanish (eliminate dead keys)
Swahili (Kenya)	Spanish - Spanish (include dead tilde)
Swahili (Tanzania)	
Swedish	
Switzerland	
Taiwanese	

Detect Keyboard Layout

Back   Continue

It is important to try the following characters

- /
- #
- $
- {}
- * ?
- > <
- : | \

They are used in many commands

3. Installation and configuration of Ubuntu 19.04

- First steps: It is recommended to download updates. The other options are up to you

3. Installation and configuration of Ubuntu 19.04

▸ Erase disk and install Ubuntu: Not recommended. Clicking "Something else" you can manage the partitions in a more efficient way

3. Installation and configuration of Ubuntu 19.04

It is better to select "Something else" in the previous picture, to create or resize partitions ourselves

Linux operating systems need at least two mounting points
1. Root (/)
2. Swap area

However, it is also recommended to reserve space for:
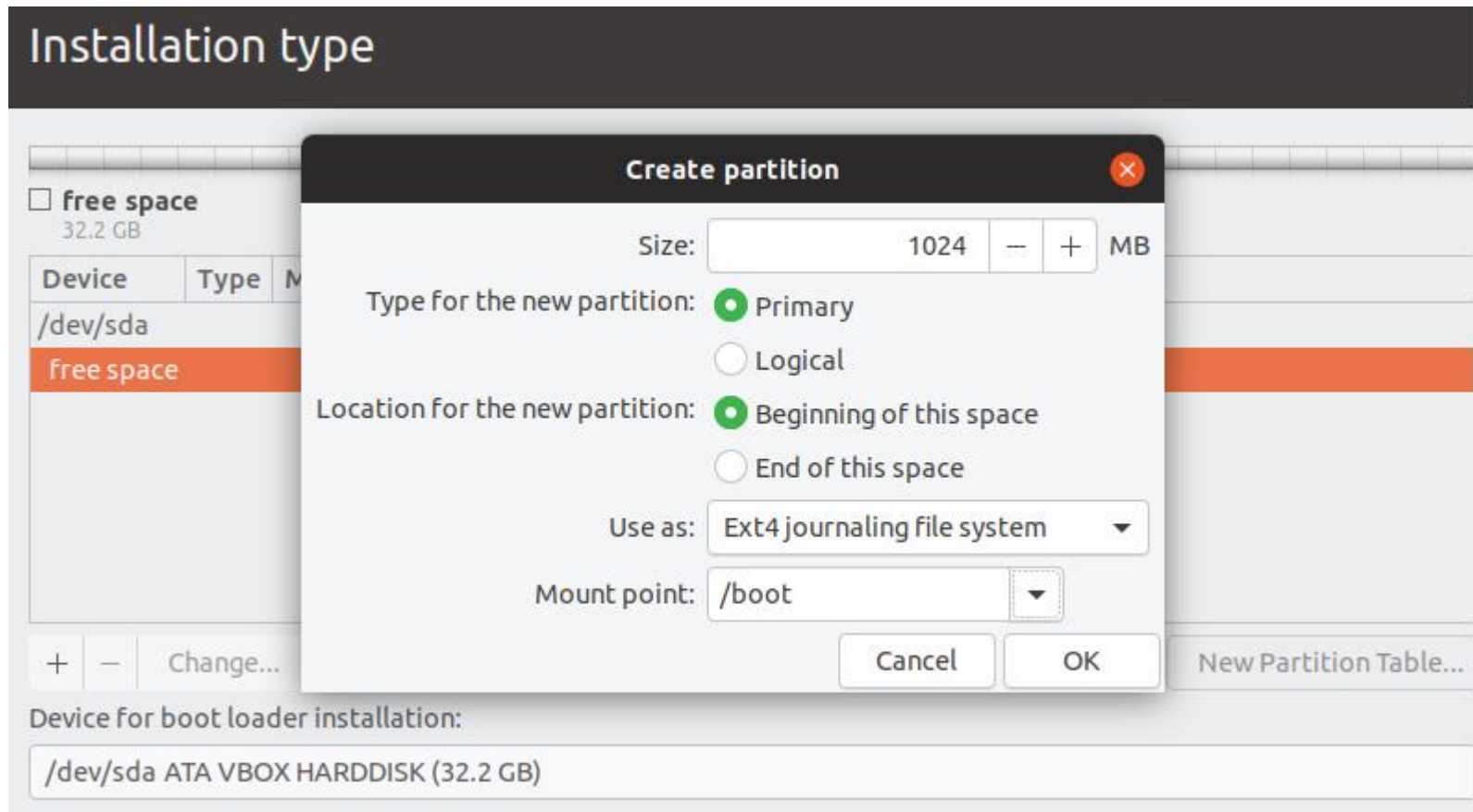3. Bootloader (/boot)
4. User data (/home)

/boot	SWAP	/home	/
250MB ~ 1GB	RAM or X2 RAM	X GB	Y GB

3. Installation and configuration of Ubuntu 19.04

Considerations on Linux partitions

- The mostly used file system in Linux is ext4.
- Swap area uses its own file system.
- There is a special nomenclature that Linux uses to refer to secondary storage that must be understood.
    - /dev/sda1   first partition on the first drive
    - /dev/sda2   second partition on the first drive
    - ......
    - /dev/sdb1   first partition on the second drive
   - /dev/sdb2   second partition on the second drive

3. Installation and configuration of Ubuntu 19.04

▸ Assign disk space: Boot (1GB recommended). This will be the only primary partition we will use. Better primary to avoid problems when booting the system

Installation type

☐ **free space**
32.2 GB

| Device	Type	M
/dev/sda		
free space		

Create partition ✕

Size: 1024 − + MB

Type for the new partition: ● Primary
○ Logical

Location for the new partition: ● Beginning of this space
○ End of this space

Use as: Ext4 journaling file system ▼

Mount point: /boot ▼

Cancel   OK

\+ − Change...   New Partition Table...

Device for boot loader installation:

/dev/sda ATA VBOX HARDDISK (32.2 GB)

3. Installation and configuration of Ubuntu 19.04

▸ Assign disk space: Swap (equals or double the RAM size recommended). In the following picture, we have a 1024 MB RAM memory, so we create a 2048 MB partition
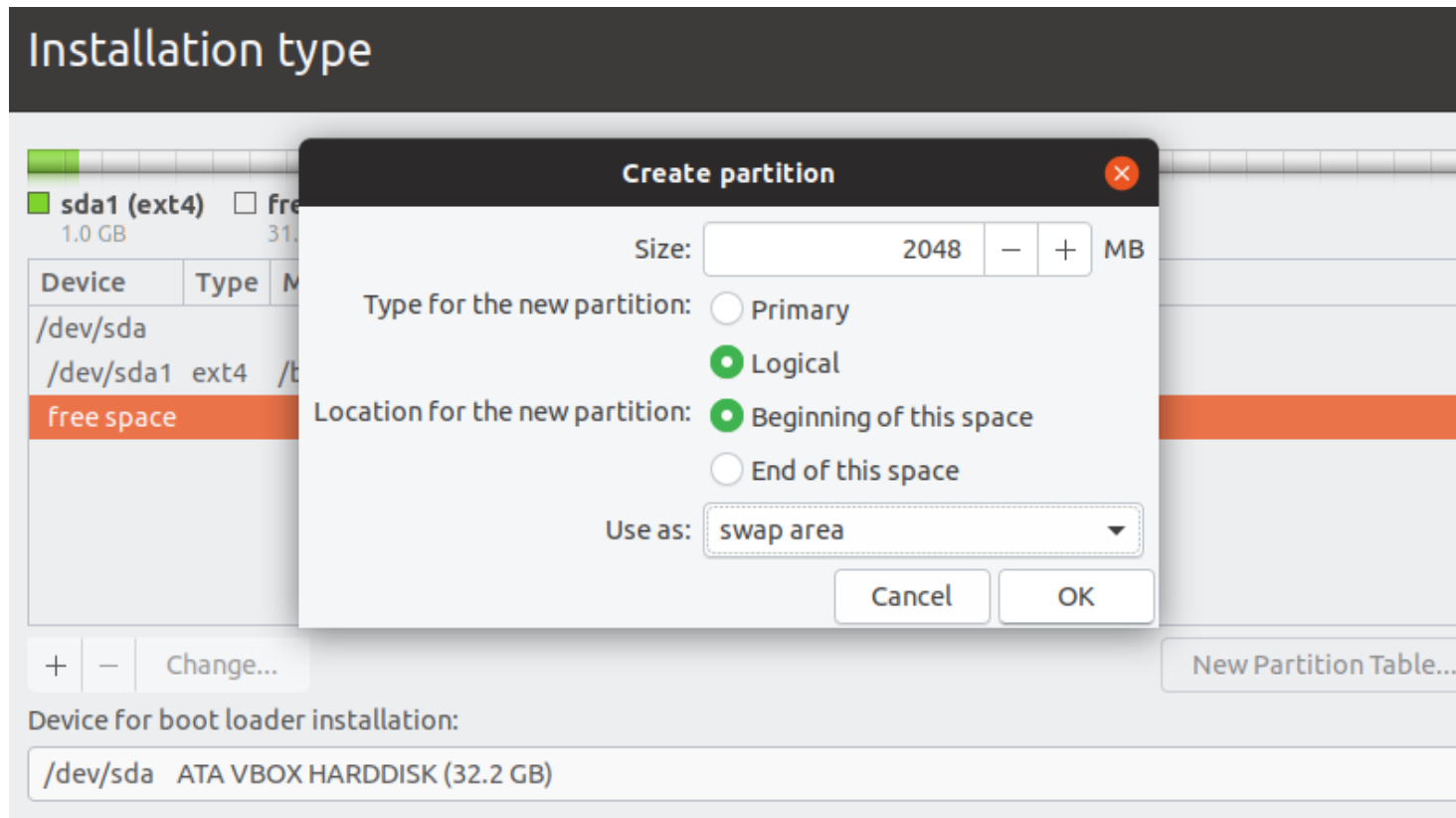
3. Installation and configuration of Ubuntu 19.04

- Assign disk space: / (root for operating systems and programs). The size will depend on the amount of programs we want to install. Recommended <u>at least 10 GB</u>. It can be a logical partition.
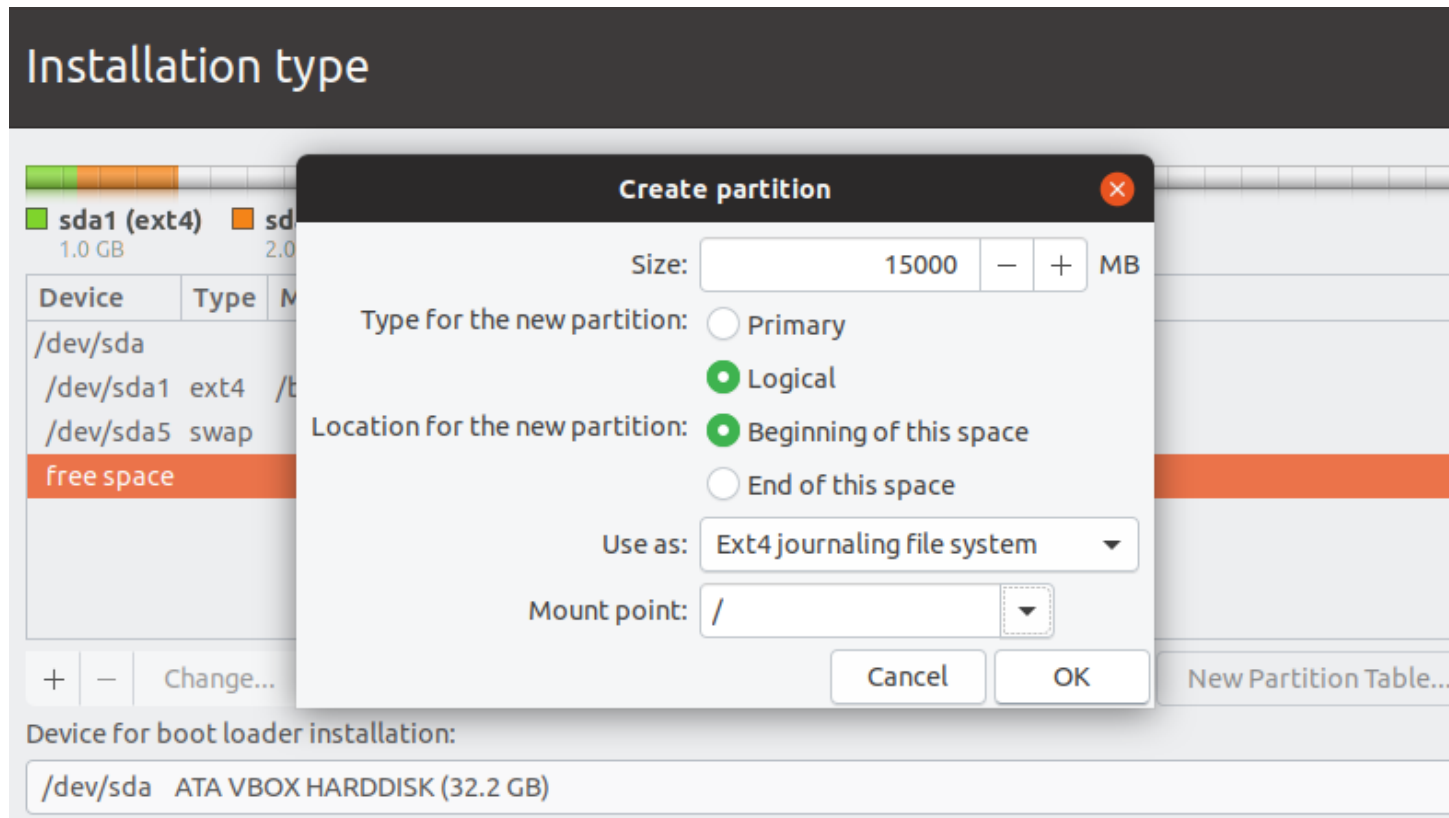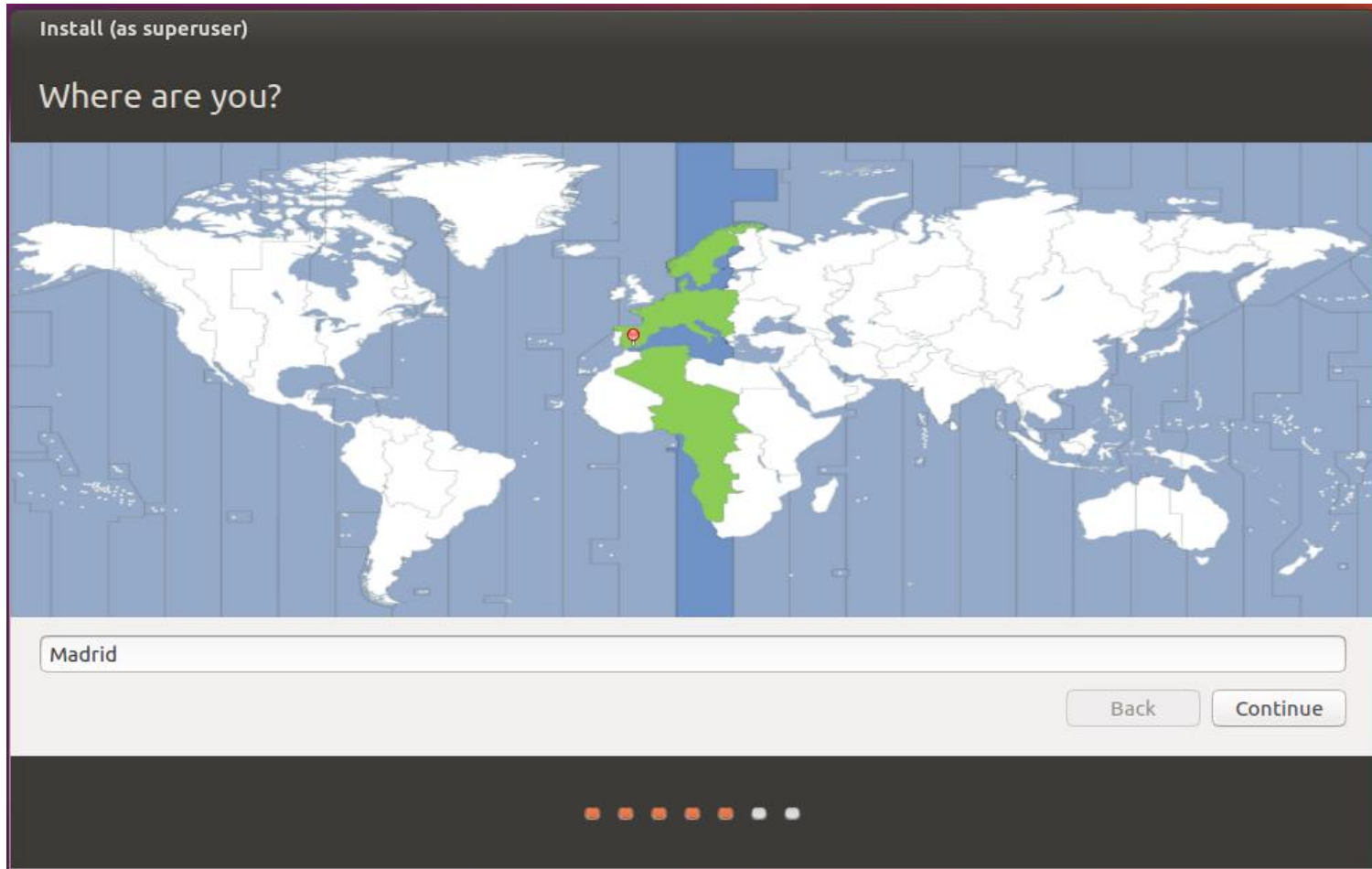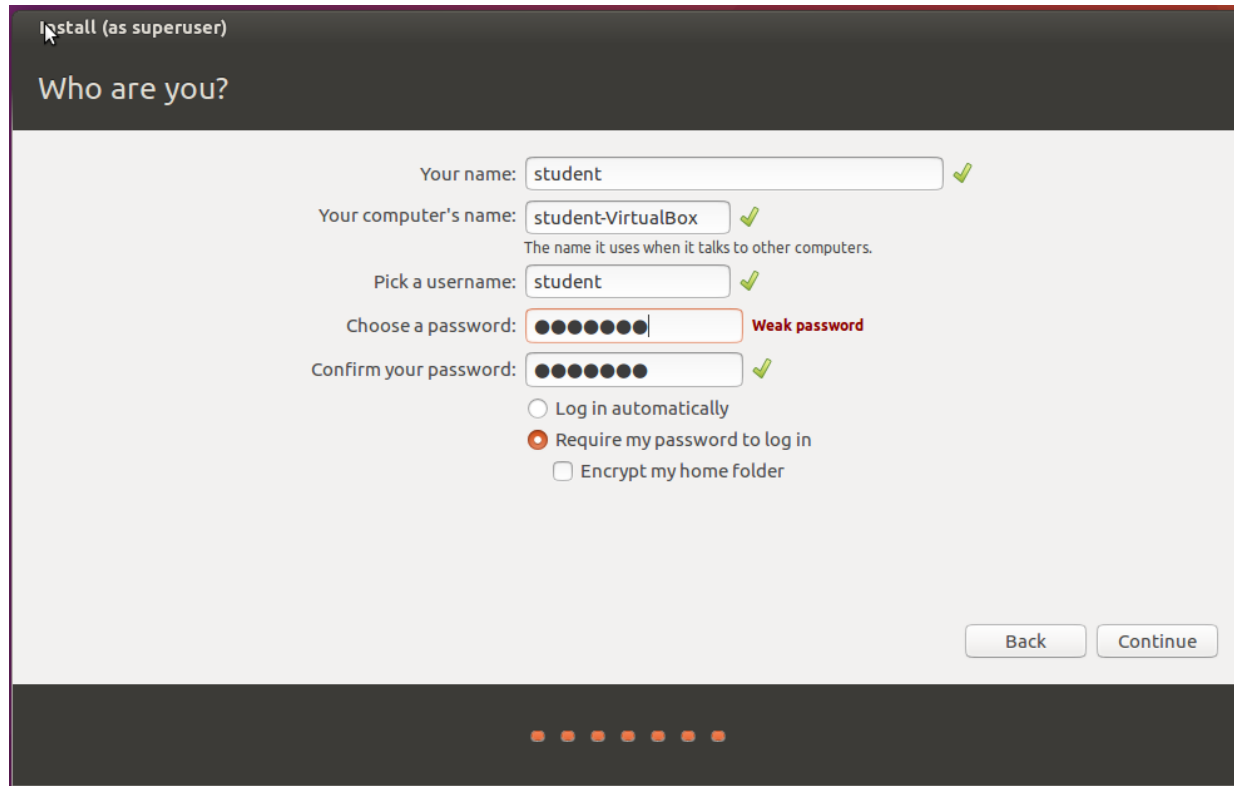
3. Installation and configuration of Ubuntu 19.04

▸ Assign disk space: /home (for user data such as documents, music, pictures, etc.). It depends on the data you want to save in your profile folders. It can be a logical partition
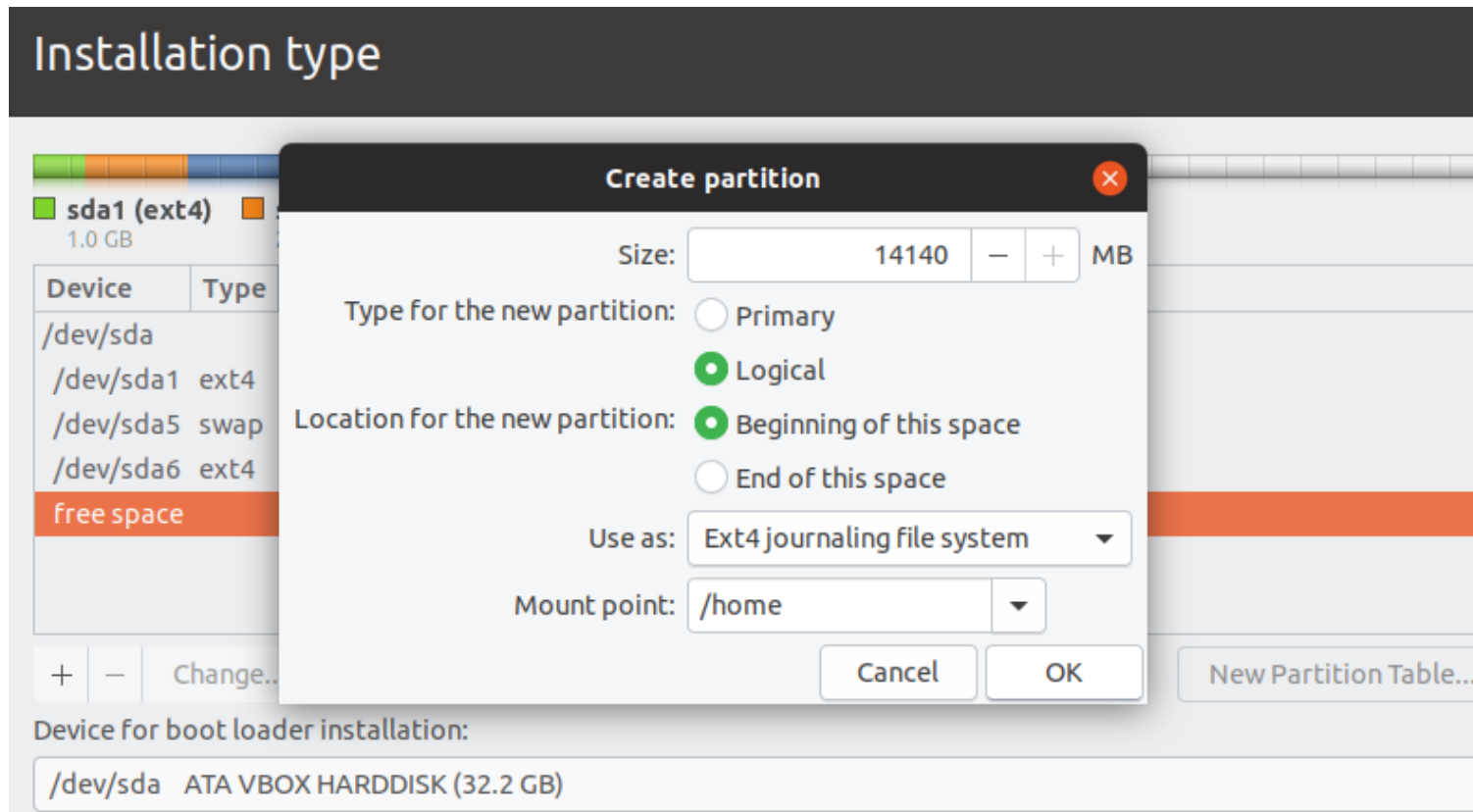
3. Installation and configuration of Ubuntu 19.04

▸ Assign disk space: Recommended distribution. An overview

Installation type

| | sda1 (ext4) 1.0 GB | | sda5 (linux-swap) 2.0 GB | | sda6 (ext4) 15.0 GB | | sda7 (ext4) 14.1 GB | |

Device	Type	Mount point	Format?	Size	Used	System
/dev/sda						
/dev/sda1	ext4	/boot	✓	1023 MB	unknown	
/dev/sda5	swap			2046 MB	unknown	
/dev/sda6	ext4	/	✓	14998 MB	unknown	
/dev/sda7	ext4	/home	✓	14137 MB	unknown	

+ − Change...   New Partition Table...

Device for boot loader installation:

/dev/sda   ATA VBOX HARDDISK (32.2 GB)

3. Installation and configuration of Ubuntu 19.04

▸ Select location

3. Installation and configuration of Ubuntu 19.04

▸ ## User and PC names

Linux passwords are saved in an encrypted form.

In case of forgetting, passwords can only be recovered in administration mode.

3. Installation and configuration of Ubuntu 19.04

- Installing…
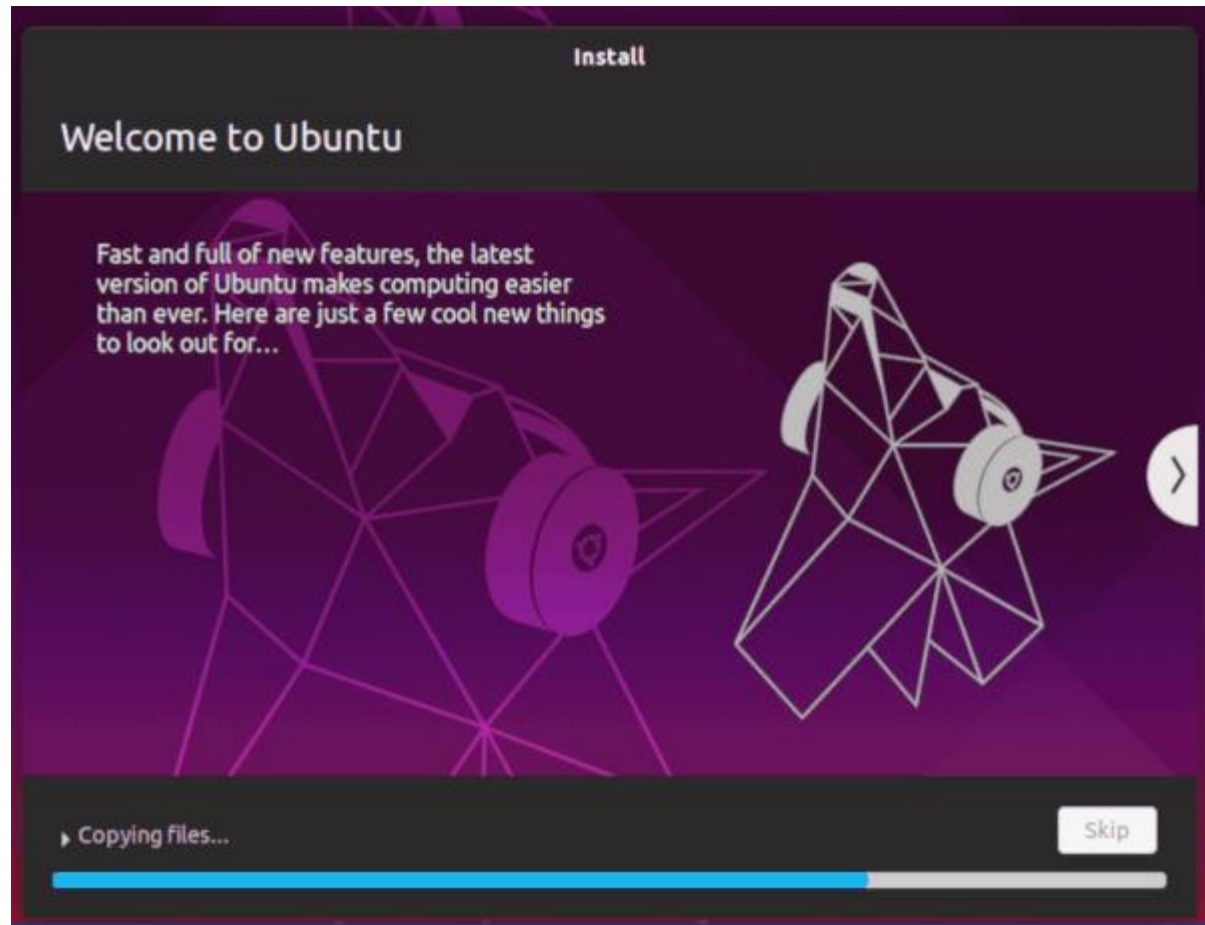
4. Post-installation configuration

▸ **Updates (Windows 10)**

1. Access Windows Update

   - Select the Start button, click Settings.

   - You can find Windows Update in the "Update & security" tab.

2. Configuring download and installation of updates

   - On Windows 10, you no longer have absolute control over OS updates.

   - They are mandatory, and they download and install automatically to ensure your device stays up to date with the latest security patches and improvements.

   - At least, you can set "Active hours" so that the OS does not automatically restart the computer during this period.

   - You can edit the register, change policies or stop Update service, but it is not recommended at all.

4. Post-installation configuration

- Updates (Windows 10)

4. Post-installation configuration

▸ **Updates (Linux systems)**

1. Configure repositories

   - A repository is a storage location from which software packages may be retrieved and installed on a computer.
   - You can edit "/etc/apt/sources.list" to add or remove repositories.

2. Update software packages
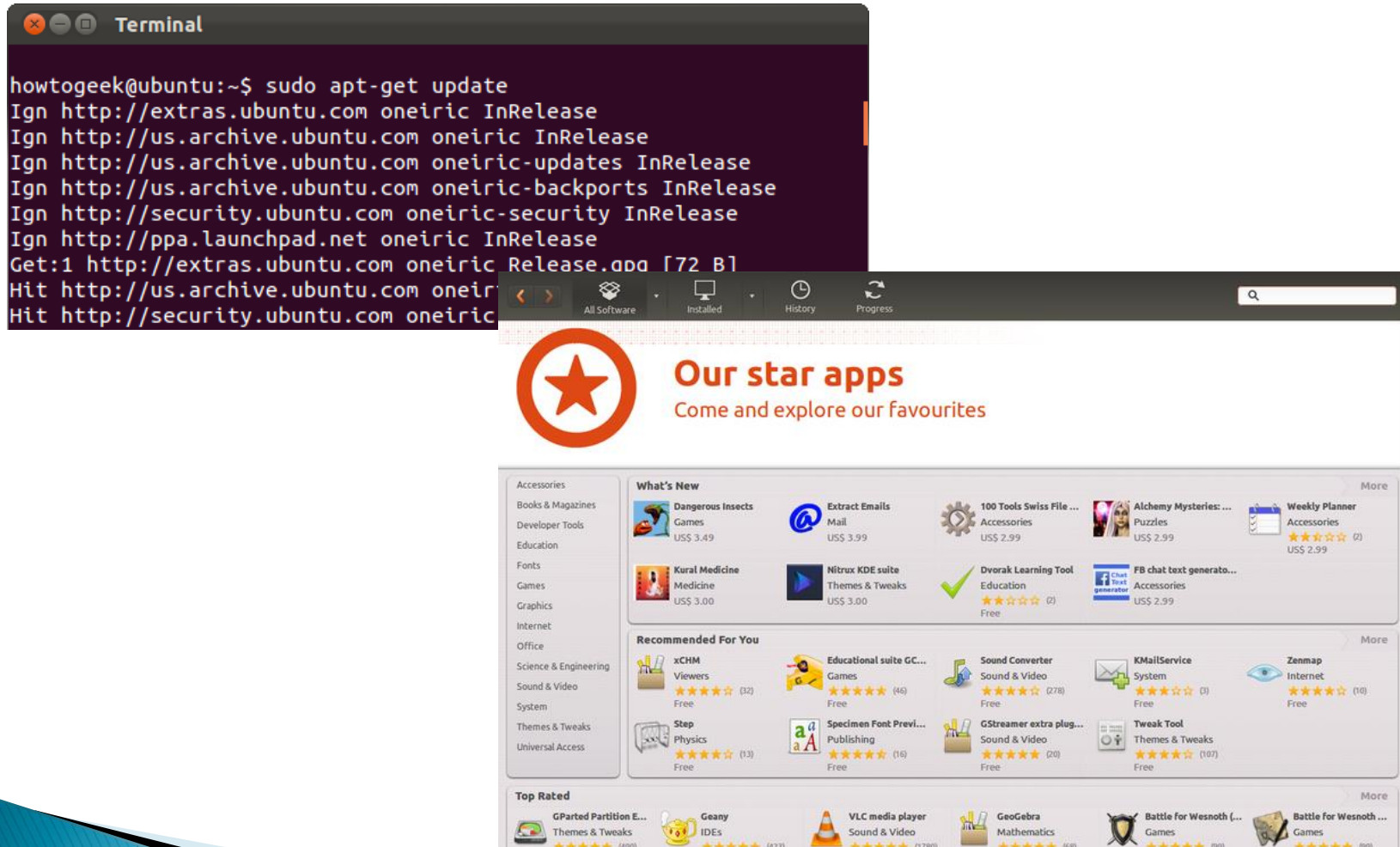
   - Typing in command line "apt-get update".

3. Update software packages already installed

   - Typing in command line "apt-get upgrade"
   - However, the command "apt-get dist-upgrade" looks for dependencies with the newer version of the package being installed and it tries to install a new package or remove an existing one on its own.

There are graphical package managements, such as Synaptic or the Software Center.

4. Post-installation configuration

- Updates (Linux systems)

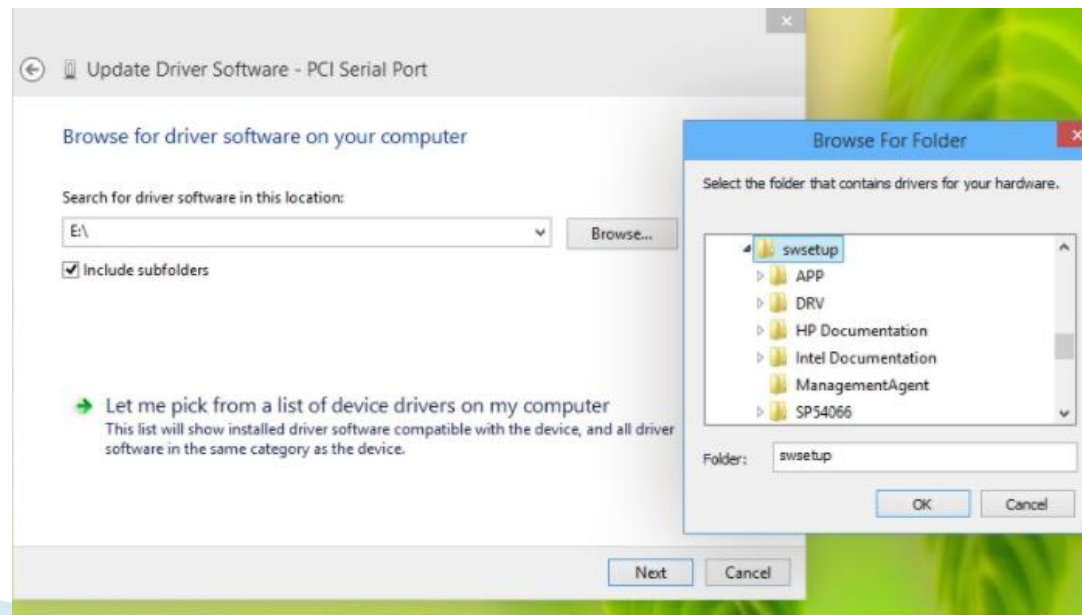# 4. Post-installation configuration

▸ ## Drivers (Windows 10)

1. To manually configure drivers, select the Start button and type "Device Manager".

2. Once there, if your driver was not detected or installed by Windows Update, you can try installing the driver manually if you have a compatible version.

3. Once device manager is open, select the device, right click it and click Update Driver Software
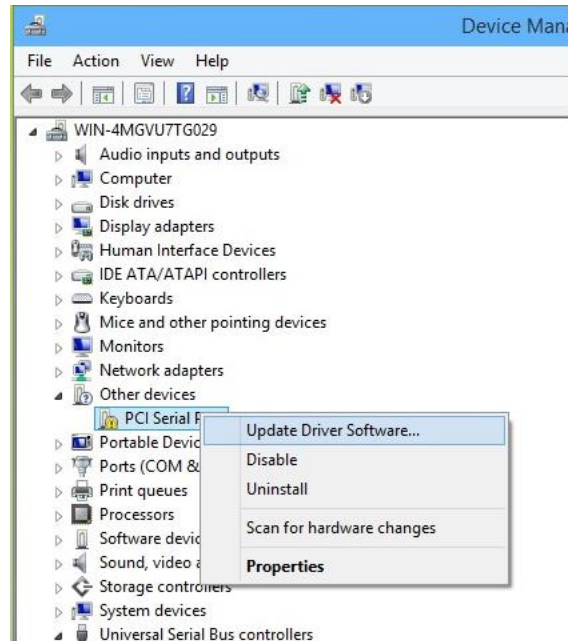
4. Post-installation configuration

▸ Drivers (Windows 10)

4. This will launch the update driver software wizard, which presents two options.

- • **Search automatically for updated driver software** – its possible Windows might have the driver software if you have not checked it yet, if its taking too long, then the next option is usually best.

- • **Browse my computer for driver software** – if there is a compatible driver and you already have the driver files, then all you need to do is point to it and Windows automatically install it for you.

4. Post-installation configuration

▸ **Drivers (Linux)**

- Every Linux distribution handles drivers in a different way, but you can always install them like a software package in command line.

- On Ubuntu and Ubuntu-based distributions, there's an "Additional Drivers" tool.

- Open the dash, search for "Additional Drivers," and launch it.

- It will detect which proprietary drivers you can install for your hardware and allow you to install them.

5. Documentation

Companies usually require to document the steps, total time and incidents during the installation.

The most important data to collect is:

- Installation date
- Person who has performed the installation
- PC Identifier
- PC Hardware
- Location and installation mode
- Installation type: normal, upgrade, migration
- Installation environment
- Attended or unattended
- OS versión and license
- Installed software
- Network configuration data
- Keep track of incidents during the installation