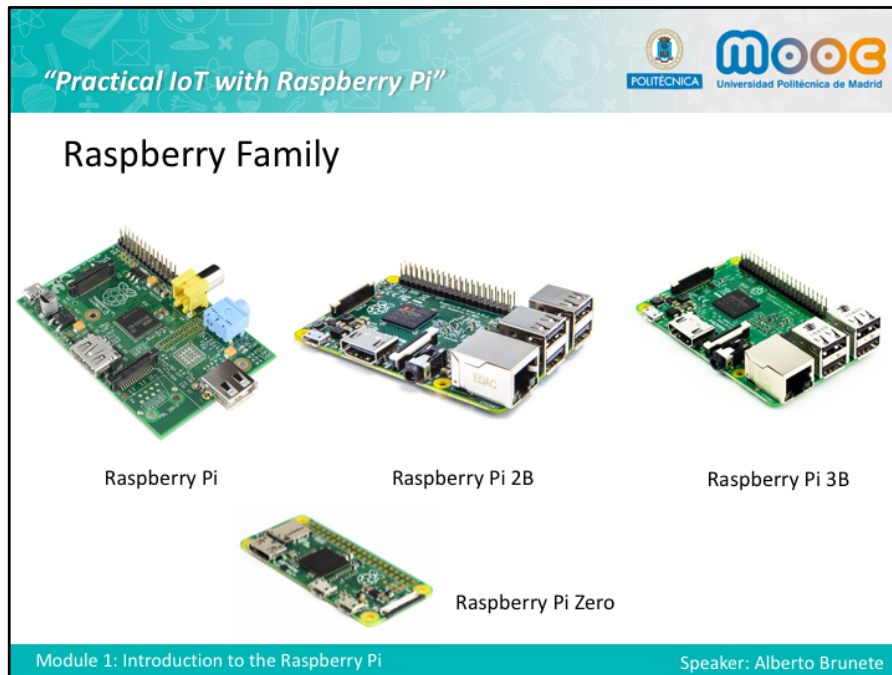


Welcome to the Module 1, and to the first video, Introduction to Raspberry Pi. Since we will be working with the Raspberry Pi, we have to get familiar with it. That's what we will do in the first video.



The Raspberry Pi is a credit card-sized single-board computer developed by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools.

The Raspberry Pi is a complete computer that runs a linux operating system. It can be used for programming, writing or painting. But it also has an input and output ports that allows it to monitor and control the environment. For example to read temperature or humidity, and switch a light or move a motor. It is an amazing device that can be used for the IoT for just 35\$!

Several generations of Raspberry Pis have been released. The first generation, the Raspberry Pi 1, was released in February 2012. The Raspberry Pi 2 was released in February 2015 and Raspberry Pi 3 in February 2016. These boards are priced 35\$. A simpler model was released in November 2015, the Raspberry Pi Zero with smaller size and limited input/output (I/O) for just 5\$.

We will be using the Raspberry Pi 3 for the course, but you can also use the Raspberry Pi 2 in case you have one in most of our lessons.

“Practical IoT with Raspberry Pi”

What is the Raspberry Pi?

Module 1: Introduction to the Raspberry Pi
Speaker: Alberto Brunete

Let's identify the parts of the Raspberry Pi 3.

This is the brain of the board, the Broadcom system-on-chip (SoC) including a 64 bit processor with 4 cores ARM Cortex running at 1.2GHz, and a graphics processor. It is linked to a 1GB LPDDR2 memory module on the rear of the board.

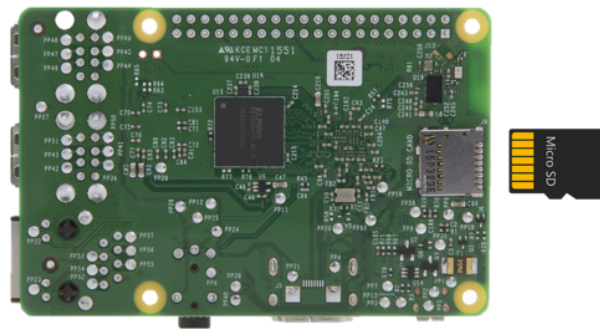
These are 4USB 2.0 ports and the 10/100 Ethernet port. It is important to mention that all USB and Ethernet ports share the same USB channel, acting as a USB-to-Ethernet adaptor and USB hub. This could be important if the USB consumption is too high. Some of the devices may not work properly.

On the bottom we have a jack stereo audio and composite video, a camera connector for the Raspberry Pi camera, an HDMI connector (to connect to the monitor or TV), a 5V USB connector for powering and DSI connector to connect to a screen (Display Serial Interface).

On the top we find a very important part: the GPIO: general-purpose input-output. This allows to connect digital sensors and actuators. The Raspberry Pi 3 features the same 40-pin (GPIO) header as all the previous Pis.

Another very important feature is that the Raspberry 3 has built-in WiFi and Bluetooth 4 (and Bluetooth low energy). There's no need to connect an external antenna to the Raspberry Pi 3. Its radios are connected to this chip antenna soldered directly to the board. Despite its small size, this antenna should be more than capable of picking up WiFi and Bluetooth signals – even through walls.

What is the Raspberry Pi?



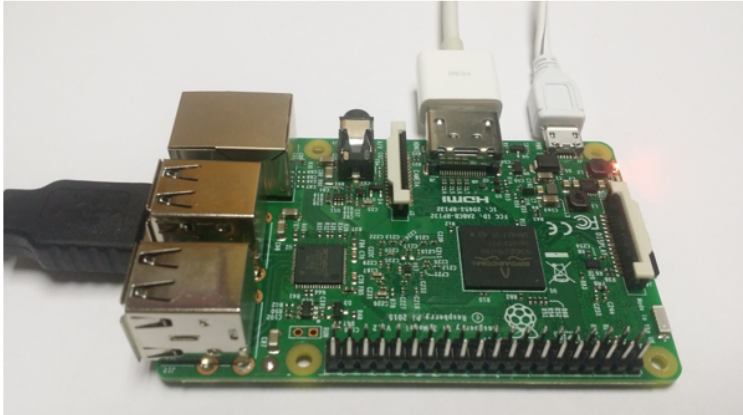
On the back side we find the communications chip, the RAM memory chip, and the SD card slot. The raspberry uses a micro SD card as HardDrive.

"Practical IoT with Raspberry Pi"

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Set up

<https://www.raspberrypi.org>



Module 1: Introduction to the Raspberry Pi Speaker: Alberto Brunete

Next thing we are going to do is to switch it on! For that we need to connect the raspberry pi to a screen through a HDMI cable, we have to connect a mouse and a keyboard, the power cable and the SD card. Make sure you have all the necessary equipment!

But, we need to put something on the SD card! We need an operating system! Let's see how can we get one. First of all, we need an SD card of at least 8GB, preferably 16GB to install de OS.

Once we get it, we go to this website, the Raspberry Pi foundation web.
<https://www.raspberrypi.org>.

- Video downloading Raspbian

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- Video: Raspberry Pi configuration
 - Expanding file system
 - Connecting to the WiFi network

Module 1: Introduction to the Raspberry Pi Speaker: Alberto Brunete

When the Pi begins to receive power, the red LED marked PWR will light. The green LED marked OK (or ACK in later version) will blink in an irregular pattern to show whenever the Pi reads from the SD card.

Please note that the BIOS for the Pi is stored on the SD card, so, if booting is unsuccessful, the Pi will show nothing on screen. If you have trouble getting your Pi to boot, read the [guide to boot problems, which contains all the troubleshooting information available at this time.](#)

If all goes well and the OS boots successfully, Raspbian starts by showing a long scrolling text that tells you exactly what the Pi is doing to get ready to work. The first time takes longer to start. After that, the graphical interface loads and you have a desktop-like OS running.

In previous versions of Raspbian, the booting up finishes with a login screen. And you needed to expand the file system, but this is already done in the last version of Raspbian jessie with pixel.

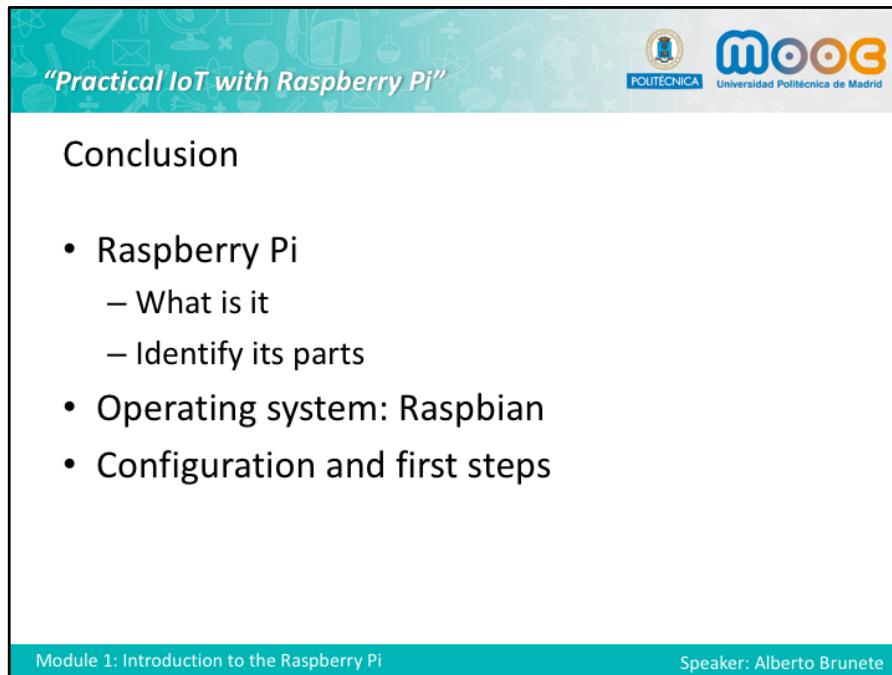
By the way, in case you need it, the default username is "pi", and the default

password is "raspberrry". You should change that not to get strangers in your raspberrry.

Open a terminal window, run the command `raspi-config` and configure your raspberrry: change the user name and password, change the timezone and keyboard layout (Internationalization options).

Finally, connect to the WiFi network and you are ready for the next lesson!

Experiment, explore and have fun!



The slide features a teal header with the title "Practical IoT with Raspberry Pi" and logos for the University of Madrid and MOOC. The main content area is white with a black border, containing a "Conclusion" section and a bulleted list. The footer is teal with white text.

"Practical IoT with Raspberry Pi"

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Conclusion

- Raspberry Pi
 - What is it
 - Identify its parts
- Operating system: Raspbian
- Configuration and first steps

Module 1: Introduction to the Raspberry Pi Speaker: Alberto Brunete

So that is all. In this video you have seen what is the Raspberry Pi and its different parts and connectors.

We have downloaded the OS and installed it in the SD card.

And finally we have set it up, switch it on, and configure it for the first use. Now you are ready to do smart things for the IoT.

See you in the next lesson!!