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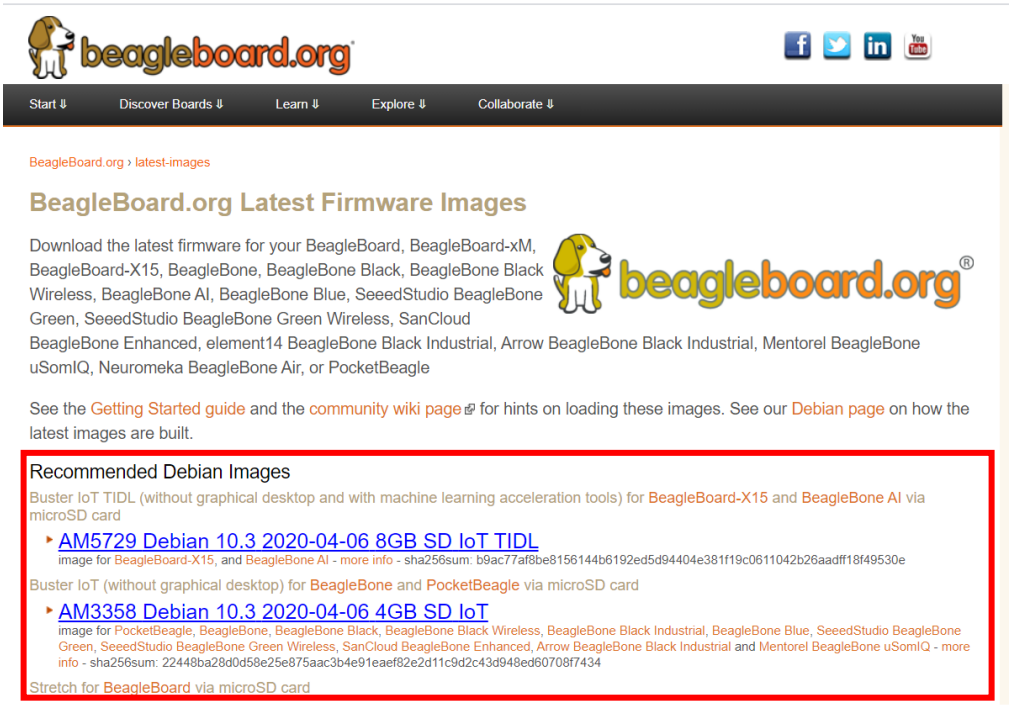
Booting the BeagleBone Black **Sebastián Arrazate Martínez**

We can make the BeagleBone Black boot up and run using different operating systems just like any computer can do. The stable versions of these operating systems are made available at http://beagleboard.org/latest-images.

The following screenshot highlights the latest Debian Image available for flashing on microSD card:

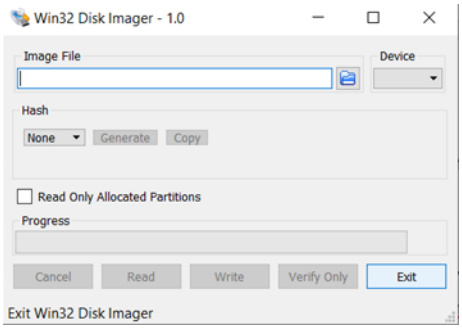


It is advisable to look for the operating systems directly from the BeagleBone official website because it specifies the ones that are supported by the board. In the previous screenshot we find 2 images of different operating systems, the difference between these is that the first has the Texas Instruments deep learning API and examples transferred to the default Debian distribution image of BeagleBone AI and to the mjpg-streamer filters.

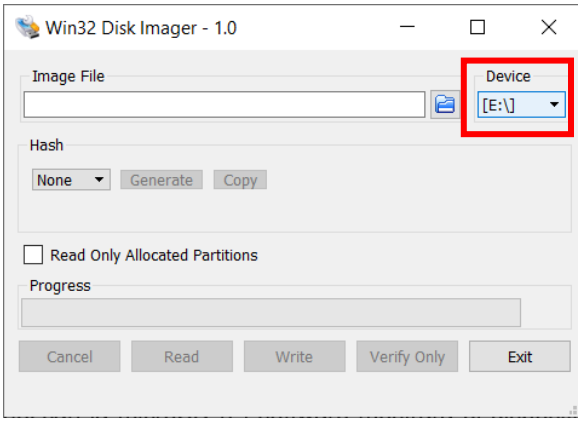
Once the operating system file is downloaded, we extract the folder from the compressed file.

To write the image file to a microSD card, we need to install the Win 32 Disk software, it can be downloaded from the following link: http://sourceforge.net/projects/win32diskimager/

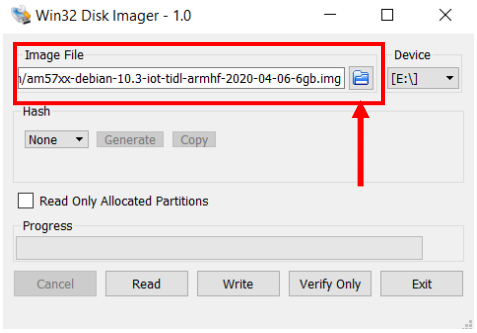
Once you download the software and install it. You should be able to see the window as shown in the following screenshot when you open the Win32 Disk Imager:



Then we must connect the microSD to your computer. Once the computer and software recognize the microSD (The software will show the device in the box marked red in the following screenshot).

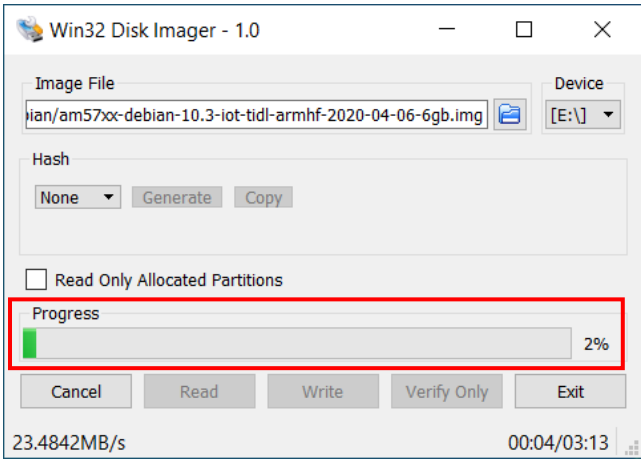


We select the image file of the operating system that we downloaded at the beginning.



We can now write the iso image of the operating system to the microSD, we click on “Write”, if you receive a confirmation or alert message, simply click on “YES” and continue.

Once you click Yes, the update process will start, and the image file will be written to the microSD card. The following screenshot shows the progress of the flashing process:

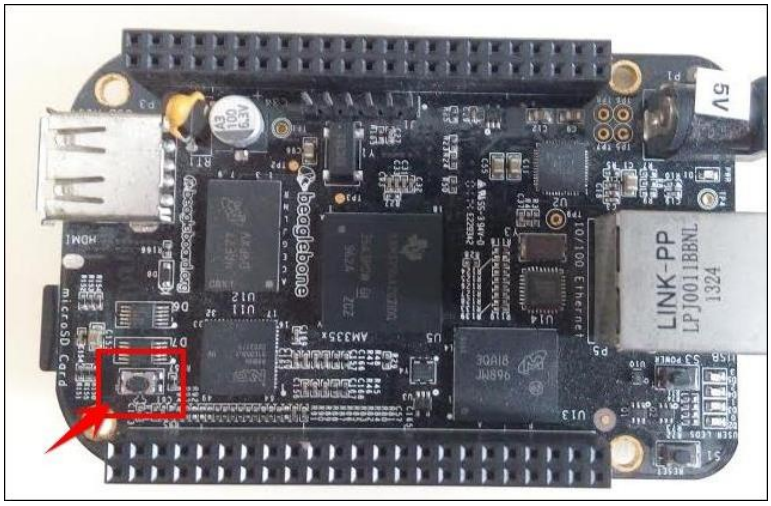


Once we have the operating system on the microSD, we proceed to start from our BeagleBone from that card.

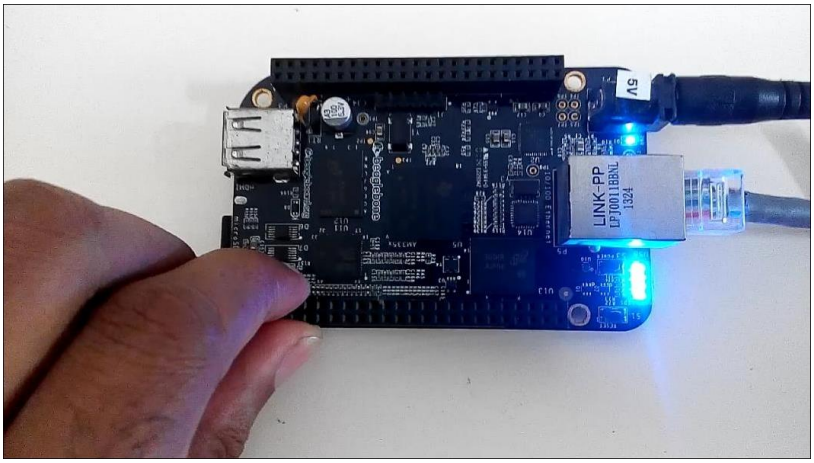
You will need your computer connected to your Router either via Ethernet or Wi-Fi and an Ethernet cable which you should connect between your Router and the BeagleBone board. The last but most important thing is an External Power Supply using which you will power up your BeagleBone board because power supply via a USB will be not be enough to run the BeagleBone board when it is booted from a microSD card.

- We insert the microSD into the BeagleBone.
- Connect the BeagleBone to the Internet Router using an Ethernet cable
- We connect the external power supply to the BeagleBone board

On BeagleBone Black and BeagleBone Green, you have a Boot Button which you need to hold on while turning on your BeagleBone board so that it starts booting from the microSD card instead of the default mode where it starts to boot from the onboard eMMC storage which holds the operating system



Once you turn on the board while holding the button down, the four on-board LEDs will light up and stay HIGH as shown in the following picture for 1 or 2 seconds, then they will start to blink randomly.



Now your BeagleBone board must have started Booting from the microSD card, so our next step will be to log in to the system and start working on it.

To get started, log into your BeagleBone board now, you need to install any SSH terminal software. We will work on a Linux virtual machine.

The SSH terminal software that we will use will be PuTTY, we must follow the following steps to download it in our virtual machine with Linux (Debian) operating system.

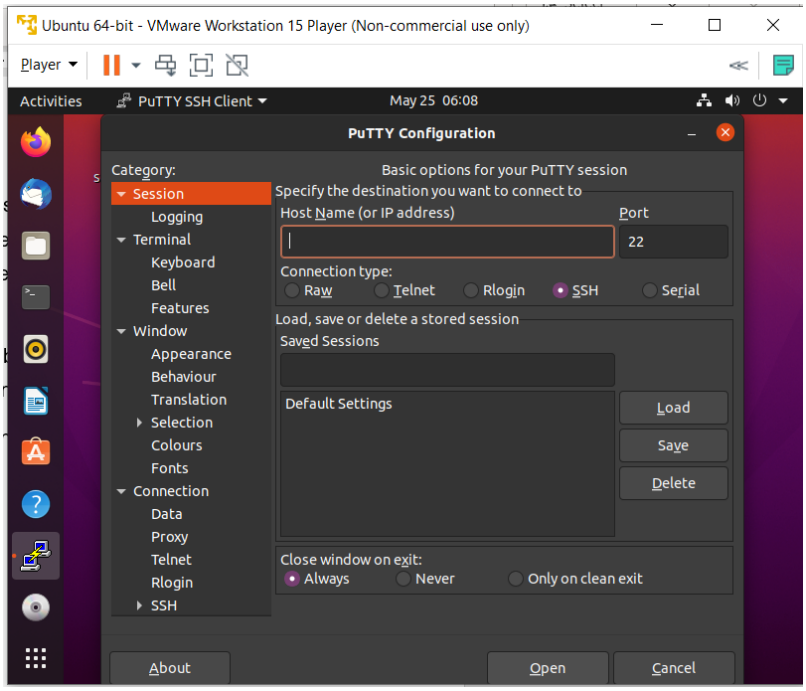
Escribimos los siguientes comandos es el mismo orden:

- sudo add-apt-repository universe
- sudo apt update
- sudo apt install putty

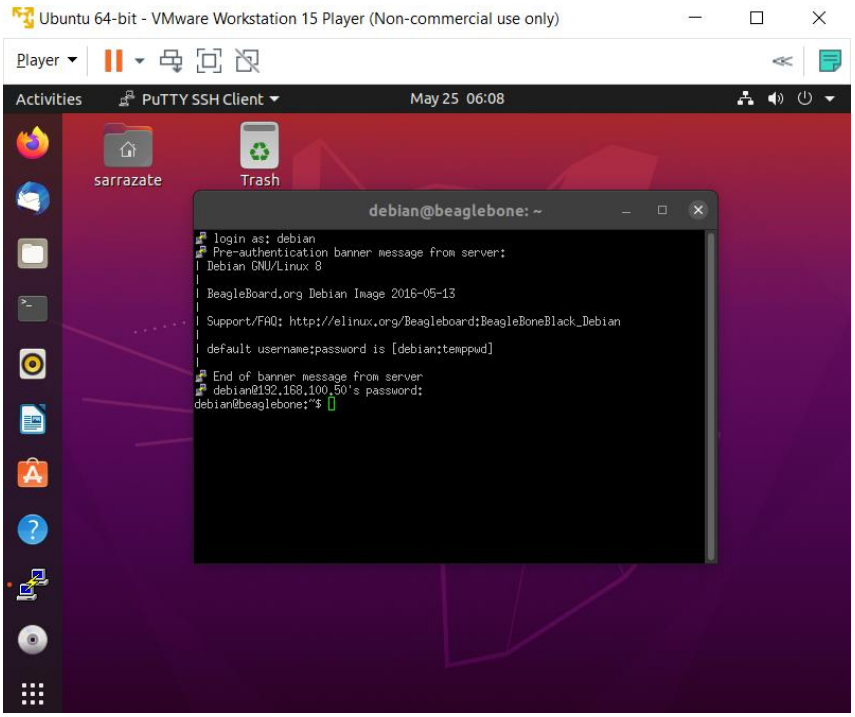
You need to know the IP address or the Host Name of your BeagleBone Black to log in to it via SSH. The default Host Name is BeagleBone but in some routers, depending on their security settings, this method of login doesn't work with Host Name.

We can find out the IP address of the BeagleBone by accessing the graphical interface of our modem by writing the network address in our browser.

PuTTY looks like this once installed on our Linux operating system:



When you get the login prompt as shown in the above screenshot, you need to enter the default username, which is debian, and the default password, which is temppwd. You should now be logged into the Linux Shell of your BeagleBone board as a user with the username debian.



Now we can work on our BeagleBone board from our SSH terminal.

Problems that occurred:

The first problem that arose to me was when I was trying to write the operating system to the microSD, something that I did not know is that the microSD to SD adapter has a lock that protects the card against writing, so it was something I had to read to solve the problem.

Another problem that occurred to me was because my virtual machine was not connected to my internet network and I could not access it, then I realized that this problem occurred because I had the continental VPN activated, so it did not allow me access to network.

The last problem was that PuTTY did not recognize my SSH connection by Host name, so it had to know the IP address of my BeagleBone, to achieve this, the simplest practice is to access the graphical environment of our modem, the problem was that the My home modem has changed the default credentials and I am not aware of them, so this form was impossible for me.

To solve this, I had to download a simple application called Advanced IP Scanner, which showed me all the IP addresses of the devices connected to my network, with this I got access to the BeagleBone.