Davide Cavaliere
www.monocilindro.com
dadez87@gmail.com
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This guide explains how to set in read mode your **Raspberry Pi 3**, running the latest **Raspbian Jessie** (January 2017). This feature is useful to avoid SD card data corruption in case the power supply goes down when Raspberry is writing on the SD card. During run-time, the root folder is overlaid, therefore the programs will run normally, thinking that they are writing on the Micro SD card, while in reality they are writing in RAM memory.

First of all, write **Raspbian Jessie** (Lite) image on the Micro SD card, using **Win32 Disk Imager**.
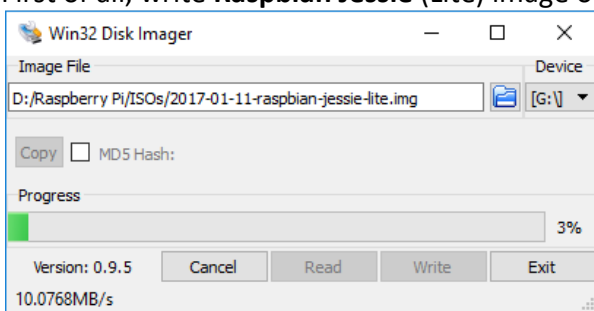
Insert the Micro SD card and connect: HDMI monitor, USB keyboard, Ethernet and Micro USB power.

Log-in (user: *pi*, password: *raspberry*).
sudo raspi-config

Expand file system

Activate **SSH** and deactivate **Serial**.
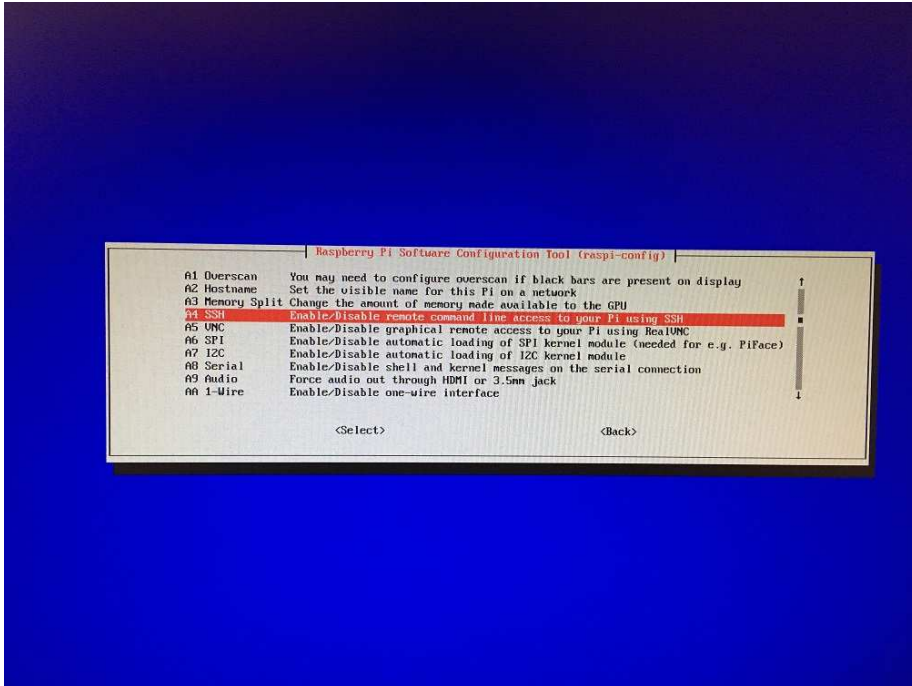
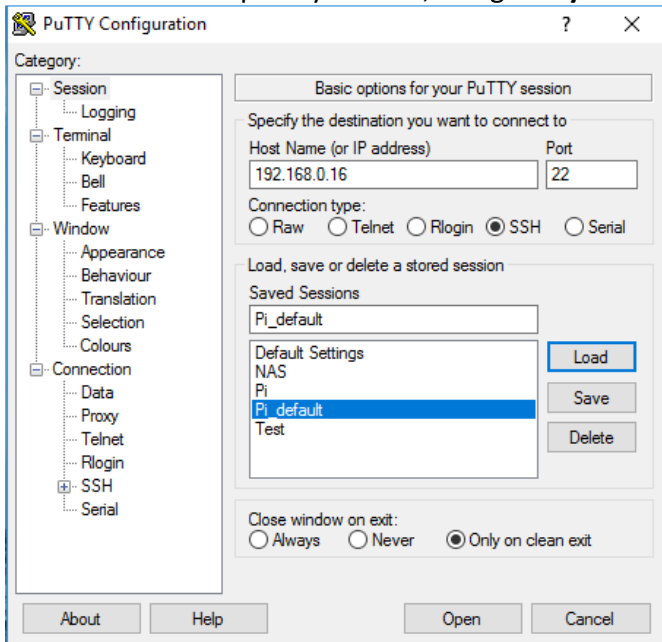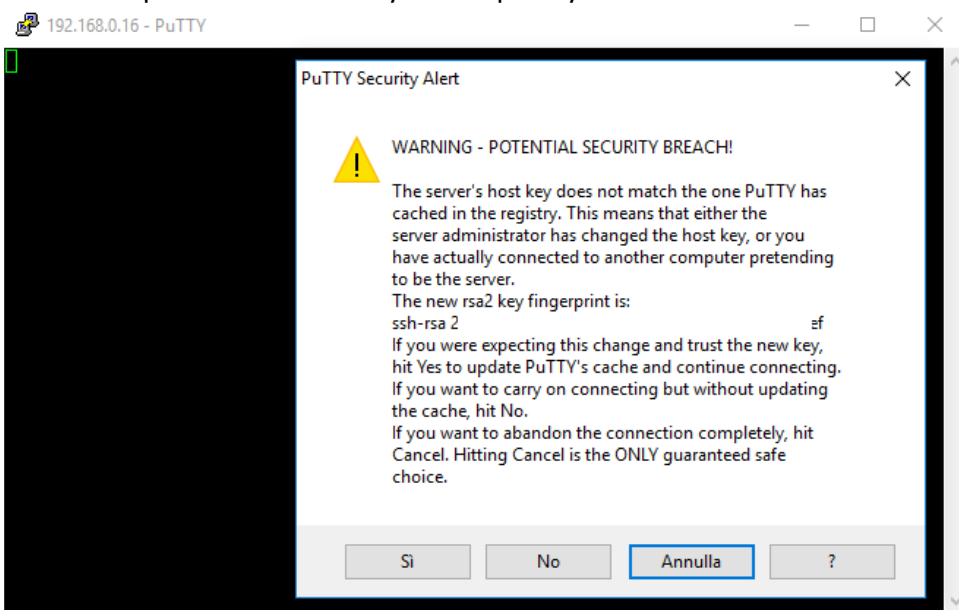Find Raspbery Pi 3 **IP address**, using, for example "ifconfig", and then reboot. Alternatively, you can use also "**Advanced IP Scanner**" from your PC.
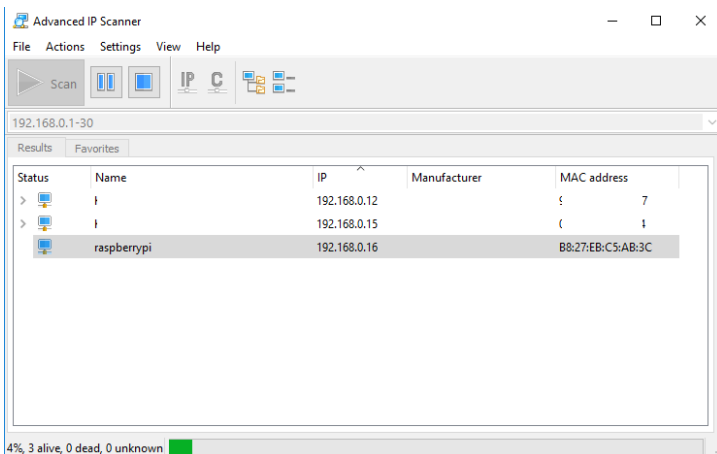
Connect to the Raspberry via **SSH**, using **Putty**.

Click on "Open" to connect to your Raspberry.

User: *pi*, password: *raspberry*.

Now we are ready for typing commands. First of all, update **apt-get** repositories.

sudo apt-get update

The following part of the guide is taken from:
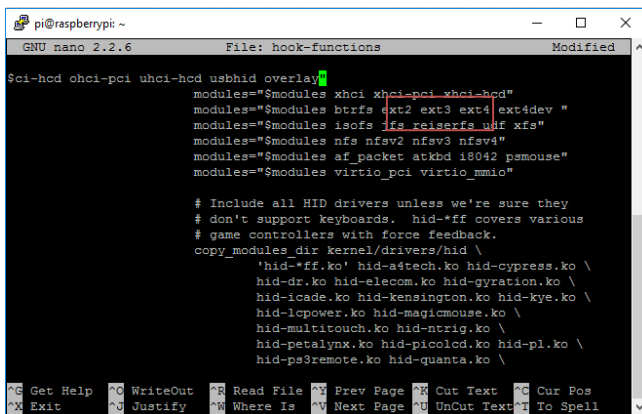
sudo bash
cd /usr/share/initramfs-tools
nano hook-functions

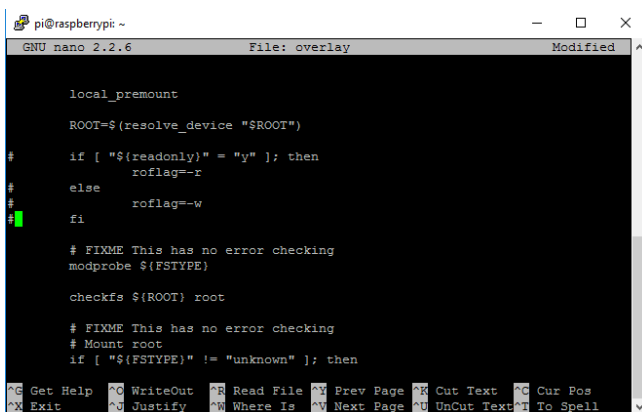Press CTRL+V and CTRL+C until you reach this part (line 528). Add *overlay*. Press CTRL+X and then Y to save.

cd /usr/share/initramfs-tools/scripts
cp local overlay
cp -rp local-premount overlay-premount
nano overlay

Search for "*local_mount_root()*" by typing CTRL+W and "*local_mount_root*". Comment the following 3 lines, by using "#", to force read only.

Substitute the following part. The complete code should look as following.

```
#  if [ "${readonly}" = "y" ]; then
     roflag=-r
#  else
#      roflag=-w
#  fi

  # FIXME This has no error checking
  modprobe ${FSTYPE}

  checkfs ${ROOT} root

  # FIXME This has no error checking
  # Mount root
  mkdir /upper /lower
  if [ "${FSTYPE}" != "unknown" ]; then
     mount ${roflag} -t ${FSTYPE} ${ROOTFLAGS} ${ROOT} /lower
  else
     mount ${roflag} ${ROOTFLAGS} ${ROOT} /lower
  fi
  modprobe overlay
  mount -t tmpfs tmpfs /upper
  mkdir /upper/data /upper/work
  mount -t overlay \
     -olowerdir=/lower,upperdir=/upper/data,workdir=/upper/work \
     overlay ${rootmnt}
```

Save and exit (CTRL+X and then Y).

uname -a

The screen will reply with something like:
Linux raspberrypi 4.4.34-v7+ #930 SMP Wed Nov 23 15:20:41 GMT 2016 armv7l GNU/Linux

Then, run the commands:

update-initramfs -c -k 4.4.34-v7+

It will require some time, like 1 minute. At the end, you will see a message like:

update-initramfs: Generating /boot/initrd.img-4.4.34-v7+

cd /boot
mv initrd.img-4.4.21-v7+ initrd7.img

The yellow parts in your command should be according to the message info received from Raspbian.

It is now time to enable the *initramfs*. If, after making the following changes, your Pi fails to boot, turn the power off, remove the SD card, and mount it in a working computer. Simply revert the changes to config.txt and cmdline.txt described below and your Pi should work normally as before. The reversion can even be done using a Windows PC as the /boot partition is FAT formatted.

nano /boot/config.txt

At the end, add the following. Then, save and exit.
kernel=kernel7.img
initramfs initrd7.img

nano /boot/cmdline.txt
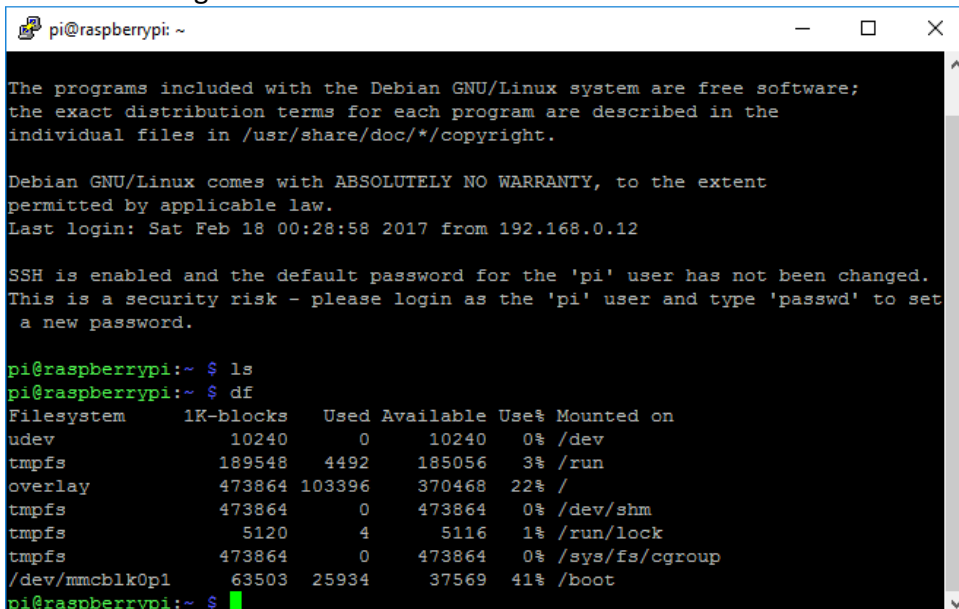
Add "*boot=overlay*". Then, save and exit.

Restart your Raspberry Pi by running:
sudo reboot now
Or
sudo shutdown -r now

After restart, in order to make sure that the overlay is working, type the "*df*" command. It should show a similar message.

If you want to check that the read-only is working properly, you can create a file, for example with "touch" command. After rebooting, the file will not be present.
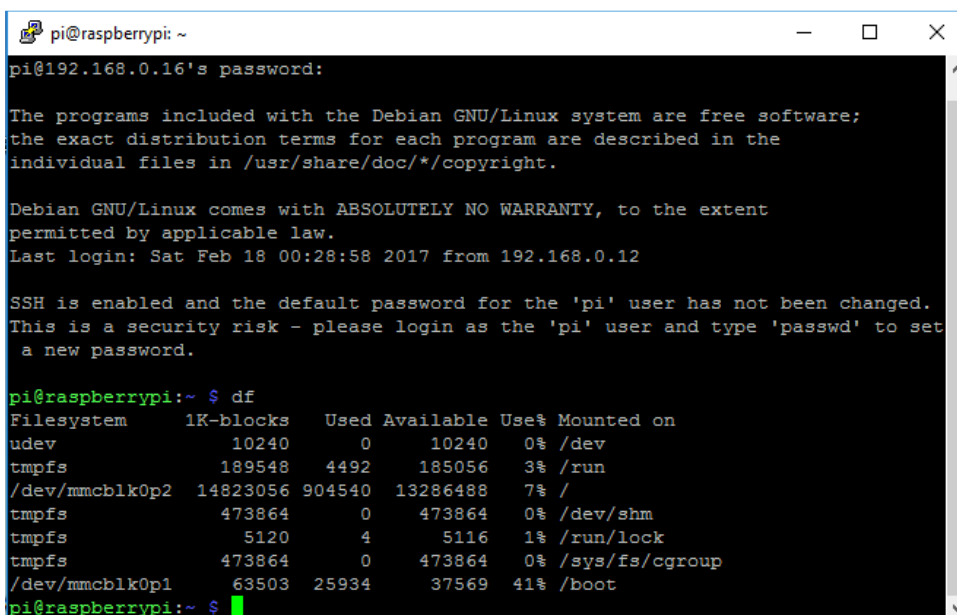
touch test_file

In the future, in case you want to update your system, or make it writeable again, all you have to do is to remove the "boot=overlay" from the */boot/cmdline.txt.*

sudo nano /boot/cmdline.txt

Save, exit, and restart. At next Power On, you Raspberry will be writeable again. You can double check it by typing "*df*" command. "*overlay*" should not be shown. Now, for example, you can install new programs and run updates (*sudo apt-get update*).