**Word Count: 1047**

Video, How to backup and restore your Raspberry Pi 4

In this video, we will show you how to backup and restore the micro SD card of your Raspberry Pi 4 in both Mac OS and Windows.

One of the great things about the Raspberry Pi is that it's very easy to reset the whole system. This is very useful for beginners who are just beginning their Raspberry Pi Journey. When you are experimenting with simple projects to get your feet wet, it's a great feature to have. When you mess something up, rather than debugging for hours about what went wrong, you can just flash a micro SD card again and Start from scratch. On the other hand, if you are doing a complex project or is building a product around the raspberry pi 4, you will need to backup the micro SD card. There are two very good reasons to backup an image of the micro SD Card. One obvious reason is to have a backup, if something fails in the system. The other reason is specific to product development. Let's say you made a successful product prototype and want to start making in mass quantities. You won't go about manually installing the software from scratch on each and every unit. Will you? No! Instead, you will clone the image of the backup of the prototype Raspberry Pi 4. And as a bonus, you can more easily share your Raspberry Pi projects by just writing your cloned image out to a new SD card or sharing the image itself.

Whenever you are doing a long haul project like let's say a machine learning or image recognition project, at one point or another, you are bound to face a software or hardware related error. Most of the time it will be a hardware related issue, like a corrupted micro SD card, from a power outage, bad cable, or unstable overclocking. you know how annoying it can be to start from scratch. But we can fix that by backing up. In this course, we recommend you to take backups at 3 instances. The first backup can be taken now, which will allow to you skip all the configuration and updates, if by chance, the micro SD Card corrupts. The second backup should be done at the end of Section 4, and Finally, take a backup at the end of Section 5.

After shutting down your Raspberry Pi 4, remove the micro SD Card reader and connect it to your PC with an adapter or a card reader. I will show you the backup and restore procedure for both Windows and Mac users. For Windows, you need to download a software called win32 disk imager from the link given in the resources section. After installing, open the application. When you connect your Raspberry Pi 4 micro SD card to your system, Windows will warn you that the card is unreadable and need to be formatted. Do not format it. Windows doesn't understand Linux based SD Card partitions. Anyway, in the Win32Disk imager first select the device, Here it's the boot partition of the micro SD Card. Your Pi microSD Card might have multiple partitions to choose from. Don't worry, the Win32 Disk imager will clone the entire card even though you have just selected the boot partition. Now click on the folder icon and select the directory you want to save the image file with its name followed by the image extension ".img". Leaving all other options as default, click the read button.

Now the backup is started. Have a cup of coffee and come as this might take some time depending on your micro SD Card. The software creates an exact replica of the micro SD Card, thus even the empty space is taken into the image. This makes the image size as big as the total space in the micro SD card itself. Once finished, you will be greeted with a popup saying "read successful". Now you have got yourself a backup of your Pi 4 micro SD Card. Now to restore the Image file when your micro SD Card gets corrupted, you can use the same software itself. Make sure that you have formatted the micro SD Card using SD Card formatter before using win32disk imager to restore the old micro SD Card image. To restore the old image, click the folder icon and select the proper image, the freshly formatted micro SD Card drive and click the write button. The writing process will take considerably more time than the reading process, so be patient. The estimated time is shown at the bottom right corner of the application.

Now let's look at how to do the same in Mac OS. Open the terminal in Mac. Now type the following command to list all the storage devices. Identify your micro SD card by looking under NAME and SIZE and verify the correct volume. Now type the following command to create a disc image of your microSD card on the Desktop with the name **raspberrypi4.dmg**. I have provided this long command in the resources section. Don't forget to change the disk volume name to the one you saw on your terminal earlier. The process to clone the SD Card may take some time, and you will not be shown any progress in Terminal, while the SD Card is being copied. You will, however, be shown a message when the process is complete.

I will now show you how to restore an image to the micro SD Card. Insert a blank or formatted micro SD card on your Mac. Locate the volume of the disk with the "diskutil list" command like earlier. Now use the following command to clone the disk image saved earlier to the new micro SD Card. This process can take some time, and no progress will be shown. Don't worry, wait patiently. Once completed, pop in the micro SD Card back to revive your raspberry Pi 4.

Summary

In this video, we have covered the following topics

* Backup and Restore the MicroSD Card in Windows
* Backup and Restore the MicroSD Card in Mac OS

In the next video, we will look at several troubleshooting methods for most frequent issues faced by the Raspberry Pi 4.