

Swapping out a HDD for a SSD (rev 9/4/24)

After reading all the good things about Solid State (SSD) Drives you decide you want to swap out the mechanical hard drive (HDD) in your computer... but how do you do it?

The first thing you might want to know is the HDD uses two voltages, +12 volts and +5 volts. The SSD uses only 3.3 volts but has a built-in regulator that draws all of it's power from the 5 volts. It does not even look at the 12 volts, it is just there and will do nothing. This is irrelevant but I just mention it as background information.

All modern computers, at the time of this writing, use the standard SATA system and connector so are plug-for-plug interchangeable, unplug one SATA device and plug in the other.

I will have to be somewhat general because depending on what operating system you use, names will be different, yet the process is the same. When I Purchase a desired SSD from Amazon (for example) what I get is a blank, UN-formatted device. If I plug it in, it will do nothing. You need to know what format you need. For example I run the Linux operating system and I want to format it in EXT4. A windows computer cannot even read that format. There are many choices but you will want to use whatever the HDD being replaced is using. Find out by using your disk management utility and look to see what it is. With Windows it might be NTFS or maybe VFAT32. Linux can read NTFS but cannot read VFAT.

It is easiest if the new SSD is not the system drive as it can be initialized, partitioned and formatted and installed, then used. Using your disk utility create a partition table, than create a partition (just use defaults and it will create one full-disk partition), then format to the desired format. You are ready to use this drive.

If the SSD is to be used as a system drive and be bootable, by far the simplest thing to do is install the formatted drive then boot up from a CD or USB installation device and go through the install process, IF you have an installation device. If you do not, that can be a problem unless you can make one by downloading the “.ISO” image file.

Making a clone of the old system disk works however few users have access to a good cloning tool, and there is always the problem that most cloning software requires the new drive to have the same, or greater capacity than the disk being cloned.

The best way I have found to clone is to use the FIDECO unit I purchased on Amazon, it is \$40.99, and I see a Sabrent unit that works as well, for \$36.98. If you want to look, click on [Docking Devices](#) (pdf file). Prices mentioned are at the time of this writing.

Scroll down and you also see the FIDECO unit for \$25.99. Not as nice but it works very well also and will do the cloning even from different type drives, like IDE to SATA.

With these units you do not need it attached to the computer, just plug in the source drive in slot one and the target drive into slot two, press the clone button and in due time you have your clone. The

clones are exactly the same and bootable if the source disk is bootable. The time it takes varies with the capacity of the drive. Large drives take hours to clone.

As an aside, on one of my systems I keep the docking station plugged in all the time and boot and run from the inserted drive. When I want to do a backup, I unplug from the computer USB3 port then plug in my backup drive and clone. Even if my primary drive failed completely I just would pull it out of the docking station, plug in the backup drive and I am back in business.

One does not even need internal drives if there is a USB3 port available. Just boot from USB (booting order) and boot from the external drive in the docking station. No more having to get into the hardware to gain access to the physical drive.

I highly recommend this approach with the external docking station.

One important side issue; you cannot clone to a disk that has not been initialized. You do need to initialize it and put it in the desired format, but partitioning does not matter because the cloning process will duplicate whatever is on the source drive. I do create a partition of the entire drive but the clone will be whatever is needed to make it a clone.

Once you have your clone, plug it in in place of the original HDD and boot up and get to work.

One additional note: Normally when you clone, the target drive must be of equal or greater capacity than the source drive, but there is one exception. If you have a Raspberry Pi-4 or Pi-5, using the `sdcopy` program, this will do it, assuming the actual data being cloned does not exceed the capacity of the target drive. One example: I had a 500 GB SSD that I wanted to put on a 250 GB SSD. The source SSD was bootable. I did the clone, then booted up with the new clone. It worked perfectly. I know of no other way to clone a bigger disk to a smaller disk. I do find that the Pi-4 software does not like drives of 1 TB or more and do not seem to be bootable after a Pi clone process, leastwise that is what I have found.

A Special Case:

I have a system that had a 1TB 'spinner' drive I wanted to replace with an SSD and I was forced to purchase a 1 TB SSD. I cloned the HDD to the new SSD, no problem. I like to use clone disk for backup so I needed another 1 TB SSD, and got it. I cloned the first SSD to the new one, no problem and decided to use the new clone as the master in the computer. Some time later I tried to clone from the primary to the backup but it would not do it. It turned out the while both SSD devices were 1 TB the primary one actually was about 27 GB greater capacity. I could not make it work. I had to purchase yet another 1 TB SSD of the same exact brand and model, and even then it did not want to work. What finally worked was I did a full new system install on the new SSD, then I found that I could clone to it, but I could not make it work from a raw formatted new SSD. My lesson learned is it is wise to have identical disk pairs, master and backup, same brand, and model, but when a clone is made from a 'spinner' to the SSD, of course this is not possible.

I have never had a problem with SSD drives smaller than 1 TB.