Reinstall OS X

The Problem

Recently (Fall 2020) I was able to purchase an old MacBook Air for my daughter to use. It is an older device, but working just fine for what she wanted. The original owner had not removed his account, and I had no admin password, so I decided to just do a reinstall. Very bad move on my part.

Apple really builds good hardware, but they don't want you to keep it too long. So, after a point, they kill the SSL keys on the repository, meaning you can no longer reinstall using the built in functions.

Rebooted the system, pressed Apple-R to go into recovery mode, and told the system to reinstall itself. After formatting the drive and starting the install, I get a timer stating it is going to take -2,393,938,938 and 8 minutes. A couple of minutes later, a message appears stating it can not download additional components needed to install OS X. Basically, the same issue described at https://www.ifixit.com/Answers/View/601830/re+installing+OSX+problems.

The First Solution

Finally got it installed. I had a friend who had a full system backup who was able to take that image and copy it to the MacBook, and it worked just fine.

Second Problem

Then, my daughter tried to install some software which corrupted the machine, so she brought it back to me to repair.

Not being an total idiot, I had made a full TimeMachine backup before I gave the machine to my daughter, so I thought “no problem, I'll just recover from TimeMachine”. Didn't work. I made the backup to an SMB network share, and the old Mac just couldn't seem to want to use it. Various failures. So, I copied the DMG to a HPFS formatted external drive that I had purchased for her (and, forgot the ._ file the first couple of times), but it still wouldn't recover.

Finally, found http://hints.macworld.com/article.php?story=2009041216314856 and decided to try it. Basically, boot into recovery mode, then open a Terminal.

```
hdid -nomount "/Volumes/Diotallevi/Clean Checkpoints/WDC Image.dmg"
diskutil list | less
dd if=/dev/disk3 of=/dev/disk2 bs=131072
```

The first command needs to be modified to mount your dmg. This mounts the dmg so you can actually see it. Well, doesn't mount it, but makes it available to diskutil, the next command.

When you run *diskutil list* | *less*, it will show you all the “disks” it knows about. You need to figure out

what the actual drive inside the machine is (hint, probably disk0 or disk1), and what “disk” the dmg is mounted as. The | *less* part of it turns on a pager so you can use the up and down arrows to go through the list, use the **q** key to quit it.

Now, based on the information you got from there, run your dd command. 'if' means “Input File”, so if=/dev/disk? means you need to change the disk to where ever you have the dmg mounted. 'of' means “Output File” which should be the disk inside the computer. 'bs' is not necessary, but making larger makes the copy go faster. It is in bytes, and I'd suggest about 50% of installed memory.

I got a bootable system out of it, but when I tried to reboot, it wanted to finish installing the OS, and would not do it on the internal hard disk. But, I was able to install it to the external (that had the dmg on it). It reformatted that disk and is now booting on it correctly.

5 days after the attempt to reinstall, that is where I stand. More later.

The Final Solution

WARNING: The following procedure completely erases the boot drive of your Mac.

Need a Mac to install on a Mac

The target OS for this machine was Mojave, v10.14. Nothing newer will work on it since it is so old. I found the installer at https://itunes.apple.com/us/app/macos-mojave/id1398502828?ls=1&mt=12, but it will only download to an OS X machine, and I didn't have one that wasn't broken. Finally, I “fixed” the machine by coping the TimeMachine image (don't forget the '.' file) onto an external USB. Booted into system recovery mode and followed the instruction in the first solution long enough to get a working OS X machine. Now, I have a working (broken) Mac.

Get the installation image

https://www.macworld.com/article/3284378/how-to-create-a-bootable-macos-mojave-installer-drive.html

This is not as simple as it sounds. You have to A) be on a mac and B) watch closely when it starts the install. It will try to immediately begin installing, and when it is done, will erase the 6G installer you just downloaded. When it starts the install, you have to immediately stop it (CMD-Q). That will leave the installer in the Applications folder.

Get Disk Creator

Now, we want to create a bootable thumbdrive from this. Go to https://www.macworld.com/article/3284378/how-to-create-a-bootable-macos-mojave-installer-drive.html. I used Disk Creator from https://macdaddy.io/install-disk-creator/ and used it to create a bootable installer onto an 8G USB thumbdrive.

Start the install

1. Make sure you have a copy of TimeMachine backup on something OS X will work with. I put it on the original USB external drive. Since it was 180G, and I was copying it off my NAS, it took 5 hours, so I started that before doing the following (I had to reformat the drive to something OS X could read also)
2. Reboot system and boot off of the newly created USB installer drive. Hold the Option button down during boot which allows you to choose the boot volume. Select the installer as the boot volume. Once the installer is booted, you will be be presented with a small menu. You are interested in two options; Disk Manager and Install OS
3. Go into disk utilities first and completely erase the entire hard disk. You have to change the view to show all devices. When done, exit Disk Utilities and return to the options screen.
4. Select Install OS. Select the (now blank) drive you just cleaned up.
5. Use Migration Assistant (part of the initial setup) to recover your information from your Time Machine backup. This is the TimeMachine image you copied in the first step, if you don't have it someplace else.

Your machine should now be back to normal. Save that installer image someplace you won't lose it, since if you only have one Mac, you can not easily redo this. I have an image on my NAS, and the bootable USB installer I created is now sacrosanct.

Links

- Burn DMG to USB https://www.androidphonesoft.com/resources/burn-dmg-to-usb-drive.html
- Restore a full-disk .dmg file to raw block device http://hints.macworld.com/article.php?story=2009041216314856
- check status of dd https://www.commandlinefu.com/commands/view/11666/check-the-status-of-dd-in-progress-os-x
- Resize Mac HD Partition https://medium.com/@kepler.donald/how-to-resize-a-mac-hd-partition-to-utilize-the-available-free-space-c4aac79b6347
- Discussion of OSX Installation Issues https://www.ifixit.com/Answers/View/601830/re+installing+OSX+problems
- Mount DMG from CLI https://osxdaily.com/2011/12/17/mount-a-dmg-from-the-command-line-in-mac-os-x/
- Restore OS from Time Machine backup https://support.apple.com/en-us/HT202406
- Mac Startup Key Combinations https://support.apple.com/en-us/HT201255
- Mojave Installer Image https://itunes.apple.com/us/app/macos-mojave/id1398502828?ls=1&mt=12
- Creating a bootable USB https://www.macworld.com/article/3284378/how-to-create-a-bootable-macos-mojave-installer-drive.html
- Disk Creator https://macdaddy.io/install-disk-creator/

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