

Cloning a triple Boot Windows, Linux and Mac OSX Intel Mac

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Background Information

This document will detail how to clone a triple boot Mac system which is a continuation of the document I wrote about installing a Triple Boot Mac. I decided to separate the two documents as some are not interested in backing up or replicating their installation to another Intel Mac which I have to for the labs.

Requirements

Pre-requisite

- Intel Mac Hardware (There is no PowerPC version of Windows)
- Functional Triple Boot System which I'm assuming you are using rEFIt to boot the OS type (Continuation from Intel Mac Triple Boot Installation via rEFIt, I'll be basing on these assumptions ie disk layout)
- Mac OSX 10.5.x Installation Discs
- Windows Installation Disc (WinXP with at least SP2 incorporated)
- Linux Installation Disc (Fedora Core 10 Installation DVD, can be any distribution but it needs to be able to support the Apple Mac Hardware)
- Download rEFIt from (refit.sourceforge.net)
- Linux LiveCD (Optional if you want to clone your installation, I choose the Fedora Core 10 LiveCD because it supported the Apple Mac Hardware)
- Firewire Cable to some sort of Firewire Storage device ie HD or another Mac
- USB removable Media (Optional if you don't have a Firewire storage device)
- Another Intel Mac with OSX (If you want to clone the Windows file System)
- WinClone (Can be downloaded from <http://twocanoes.com/winclone/>)

I will be assuming the following (apple layout map)

disk0	The Whole Disk -> GUID_partition_scheme
disk0s1	Primary Partition 1 -> EFI (Compulsory)
disk0s2	Primary Partition 2 -> Apple HFS Macintosh HD (Compulsory)
disk0s3	Primary Partition 3 -> Linux Filesystem (Ext3 or any other linux Filesystem)
disk0s4	Primary Partition 4 -> Windows Filesystem (For Windows NTFS or FAT)
disk0s5	Logical/Extended Partition 5 -> Linux Swap
disk0s6	Logical/Extended Partition 6 -> Data Partition (Fat, All OS can write to this)

Equivalent Layout in terms of linux

/dev/sda	The Whole Disk	-> GUID_partition_scheme
/dev/sda1	Primary Partition 1	-> EFI (Compulsory)
/dev/sda2	Primary Partition 2	-> Apple HFS Macintosh HD (Compulsory)
/dev/sda3	Primary Partition 3	-> Linux Filesystem (Ext3 or any other linux Filesystem)
/dev/sda4	Primary Partition 4	-> Windows Filesystem (For Windows NTFS or FAT)
/dev/sda5	Logical/Extended Partition 5	-> Linux Swap
/dev/sda6	Logical/Extended Partition 6	->Data Partition (Fat, All OS can write to this)

(Note not all linux tools may be able to address the partitions because of the nature of the hybrid MBR/GPT table such as fdisk)

As it currently stands, there is no single tool which you could just image the whole disk and replicated it onto another Mac. In saying this, it is a three part process where you need to individually image each OS partition. I say three as all we care is the OS sections ie disk0s2, disks03 and disk0s4.

To replicate the Mac OSX partitions you can use the standard apple disk utility or apple asr command. These apple tools I've mentioned can image apple file system and to a point Windows File system ie fat and ntfs but it will not inject/restore the necessary boot information for Windows to boot.

Hence for restoring Windows partition use WinClone for Mac OSX. I found Win Clone downfall is that you have to restore the Windows Image to a partition is equal or bigger in size to the image partition you got it from and you can't multicast it out like with asr or Norton ghost tools. Apple Mac OSX does not support the linux typical ext3 file system, neither does the tools that apple provide will support imaging of ext3 file system. So to restore the Linux system, I'll archive the file system and restore via the boot loader in this case grub (Lilo is deprecated moved up to grub)

Instructions

Backing up the Mac OSX Partition

- 1.) Insert the Mac OSX Installation Disc into your Mac, and plug in your removable storage media ie Firewire attached disk or Firewaire attached mac or a USB attached disk.
- 2.) Reboot the Mac and hold down "c" on and it should force the Mac to boot from the DVD drive.
- 3.) Once booted go to the toolbar and click utilities -> Disk Utility. Locate disk0s2 it should have a typical label saying Macintosh HD and select New Image it will ask you where to save it. Give it a name and store it on the attached removable disk.
- 4.) The alternate way is to Boot the Mac into Target Mode connect it via firewire to another Mac. And use Disk Utility on that Mac to image the firewire target mode Mac computer.

Backing up the Mac WinXP Partition

- 1.) You will need two Intel Macs, one Intel Mac to be imaged via target Firewire Mode and the other Mac installed with WinClone to clone the targeted firewire Windows Partition. You could get away with doing it with one Mac but then you need to boot two Mac OSX installations from the same mac by installing it on separate partitions or on a removable disk ie a firewire disk.
- 2.) Install WinClone on the Intel Mac which will do the cloning then attach the firewire cable between the other Intel Mac.
- 3.) Reboot the Intel Mac which you have attached via firewire which you want to image. Hold down "t" to force the Intel Mac to boot into target mode which should appear as another removable disk on your other attached Mac.
- 4.) Launch WinClone and select image tab, for source select the Windows Partitions of the remote attached storage drive and select image and select somewhere to save it.

Backing up the Mac Linux Partition

- 1.) You need to boot from a third party Operating system which can handle ext3 file system. You can do this with the Linux installation disc and boot it into rescue mode or use a Linux Live CD. The easy way is to use the Linux LiveCD, so in this case the Fedora Core 10 Live CD. Insert the CD and hold "c" which should boot the Fedora Live CD. A reason why a LiveCD would be better than a Linux Installation disc in rescue mode is liveCD support external filesystems ie NTFS (Windows), FAT (Windows), HFS (Apple) and a whole other bunch of filesystem (Well at least Fedora 10 LiveCD does)
- 2.) Once the CD is booted, login into the Fedora Live and plug a removable disk ie a USB removable disk which it should be automatically mounted.
- 3.) Now run a terminal from the menu and type "su root", to runs things as a super user.
- 4.) Now mount up the linux partition, if it hasn't already ie we know its /dev/sda3 from the layout. Lets say we mount it into /tmp/sda3, we type "mkdir /tmp/sda3", followed by "mount /dev/sda3 /tmp/sda3"
- 5.) Now we have to mount up the removable disc which we are going to place the image in. (Make sure it supports single file larger than 4GB and that your Live CD system which is able to write to that file system. ie removable disc partition you are going to use is should either NTFS, ext3 assuming you use Fedora Core 10 Live CD). If you not sure if its mounted you can always type "mount" which will tell you where its mounted. Lets assume that the USB removable disk is /dev/sdc1. Again we can mount it into /tmp/image by typing "mkdir /tmp/image", followed by "mount /dev/sdc1 /tmp/image"
- 6.) Now the root file system of the linux install on the mac is mounted in /tmp/sdb1 and we are going to archive it to /tmp/image. There are several ways of doing this ie using dd but I'm just going to create tar bzip file of the linux installation.

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cd /tmp/sda3
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tar cpfjv /tmp/sdb1/macosex.fc10.bgz . (This will take a long time depending on how big your linux installation is)
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Restoring Triple boot.

Now that we have backup all three OS from the Mac you can restore / clone it to another Intel Mac as long as it has a similar partition layout. So ReCreate the partition layout (If you unsure how to do so, refer to the other documentation **Intel Mac Triple Boot – Windows, Linux and Mac Howto via Refit** and repeat steps 1 to 4)

Restoring the Mac OSX Partition

- 1.) Insert the Mac OSX Installation Disc into your Mac, and plug in your removable storage media ie Firewire attached disk or Firewaire attached mac or a USB attached disk which has the backup image.
- 2.) Reboot the Mac and hold down “c” on and it should force the Mac to boot from the DVD drive.
- 3.) Once booted go to the toolbar and click utilities -> Disk Utility. Locate the partition you want to restore from a image ie disk0s2 and select restore. For source, pick and select the image you backup earlier and for the destination, drag the partition ie disk0s2 into the destination and hit restore.
- 4.) The alternate way is to Boot the Mac into Target Mode connect it via firewire to another Mac. And use Disk Utility on that Mac and repeat the above procedure on the appropriate disk partitions.
- 5.) This should take quite a while, when it is finished because it imaged the Mac OSX installation with rEFit. And subsequent successful restore of other OS system on the Intel Mac will appear on the reboot rEFIt screen.

Restoring the Mac WinXP Partition

- 1.) You will need two Intel Macs, one Intel Mac to be restored target Firewire Mode and the other Mac installed with WinClone to restore the image to the targeted firewire Windows Partition. Install WinClone on the Intel Mac which will do the restoring then attach the firewire cable between the other Intel Mac.
- 2.) Reboot the Intel Mac which you have attached via firewire which you want to restore the image to. Hold down “t” to force the Intel Mac to boot into target mode which should appear as another removable disk on your other attached Mac.
- 3.) Launch WinClone, for source select the Windows Partitions of the remote attached storage drove and select image and select somewhere to save it.