Disk Images

From OSDev Wiki

The best way for hobbyist os developers to test their systems is to use programs like QEMU, Bochs, VMware or Virtual PC.

All of these common tools rely on using disk images (either floppy or hard disk). A disk image is nothing more than a file whose content reflects the layout of a disk and that the tool will use as if it was a physical device. E.g. A floppy image typically is 1.44MB large and its 512 first bytes consist of the 'floppy's boot sector. The different sub-pages should tell you how to create such images from real disks and use them under the most common operating systems.

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Tools

These programs can help you with the management of disk images

	Linux	Windows	BSD	Mac OS X	File Systems Supported
BFI	No	Yes	No	No	FAT
fat_imgen	Yes	Yes	Yes	Yes	FAT12
File Disk	No	Yes	No	No	Anything supported by Windows
hdiutil	No	No	No	Yes	HFS HFS+ HFS+J HFSX FAT UFS
ImDisk	No	Yes	No	No	Anything supported by Windows
Loopback Device	Yes	No	Yes	Yes	Anything supported by the kernel
MagicISO	No	Yes	No	No	ISO 9660, Rock Ridge, HFS/HFS+, Joilet, UDF, XBOX DVD FS
mkisofs	Yes	Yes	Yes	Yes	ISO 9660
MTools	Yes	Yes	Yes	Yes	FAT
Virtual Floppy Disk	No	Yes	No	No	Anything supported by Windows
Win Image	No	Yes	No	No	FAT ISO 9660

If you want to write/burn an image to media you can use one of the following tools:

	Linux	Windows	BSD	Mac OS X	Notes
dd	Yes	Yes (Using Cygwin)	Yes	Yes	
Rawwrite	No	Yes	No	No	Floppy images only

Floppy disk images

You can use 'dd' to create a blank floppy image.

```
dd if=/dev/zero of=floppy.flp bs=512 count=2880
```

CD images

As of version 0.95, GNU GRUB comes with support for no-emulation El-Torito CD boot. Creating a CD image is much easier than working with floppy images and trying to stuff GRUB in them (and you get 650 meg more space too). Putting GRUB on a CD is now a simple matter of making a skeleton directory tree for the CD filesystem layout, copying the "stage2_eltorito" file in there, and running mkisofs with a specialized command line. See the GRUB 0.95 info node Installation > Making a GRUB bootable CD-ROM (http://www.gnu.org/software/grub/manual/html_node/Making-a-GRUB-bootable-CD_002dROM.html) for details. Much more humane than those floppy games.

There is also a tutorial about creating a no-emulation El-Torito CD with GRUB.

Handling of Partition Tables in images.

At the time of writing, only Apple's hdiutil can handle the mounting of partitions inside of an image cleanly. Linux users can use a hack to skip over the MBR sector. In general, you can solve the partitioning information problem by using a separate image for one partition, then insert it into a larger image with partitioning data at the right place. This works because offsets are generally relative to the start of the partition.

Images with preinstalled GRUB

If you are looking for a ready-made floppy image with GRUB already installed, such has been set up by MartinBaute, and is available from the following mirrors:

- Rootdirectory at http://www.rootdirectory.de/solar/floppy.img.zip (GRUB 0.97)
- RDOS project at http://www.rdos.net/rdos/floppy.img and http://www.rdos.net/rdos/grub.iso (GRUB 0.97)
- LibOSDK project at http://download.berlios.de/libosdk/fd.img.bz2 (GRUB 0.96)
- Clicker project at http://sourceforge.net/projects/clicker/files/miscellaneous/GRUB%20bootdisk%20(by%20Solar)/solar_grub_disk.zip/download (GRUB 0.95)

The images have GRUB stage1 / stage2 and an empty config file set up, so all you have to do is adding your binaries and editing the config file (see the GRUB manual (http://www.gnu.org/software/grub/manual) for details).

The CD/DVD image on rdos.net has an embedded bootable floppy image and the required files in the root directory.

Links

- Related thread in the forum: Topic:10549 You gonna find a nifty trick Brendan uses to build his own iso images - with NASM. (download missing)
- John Burger's Demonstration uses NASM source code to build his own ISO images too.

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