

Welcome

A Basic Tutorial Introduction to Using

Floppy Diskettes

Not Dead Yet

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First

"The rumors of my death have been greatly exaggerated."

-- Mark Twain

Consider:

- Floppy diskettes are not dead
- At least not yet

Definitions

- Floppy Disks – removable magnetic media
 - 5¼"
- Floppy Diskettes – removable magnetic media
 - 3½"
- Floppy Drive – device that reads FDs
- mount[ing] – attach[ing] a filesystem
- mount point – a directory

Alternatives

- Serial ports - cross over cables
- Networking
 - Network Interface Cards (NICs)
 - Local Area Network (switch or router box)
- Internal or external drives, Zip Drives
- Tape, CDROM or DVD discs
- USB Thumbnail Drives
 - USB 1.1/2.0 Interface
 - 64 Megabyte to 2 Gigabyte (or more)

Considerations

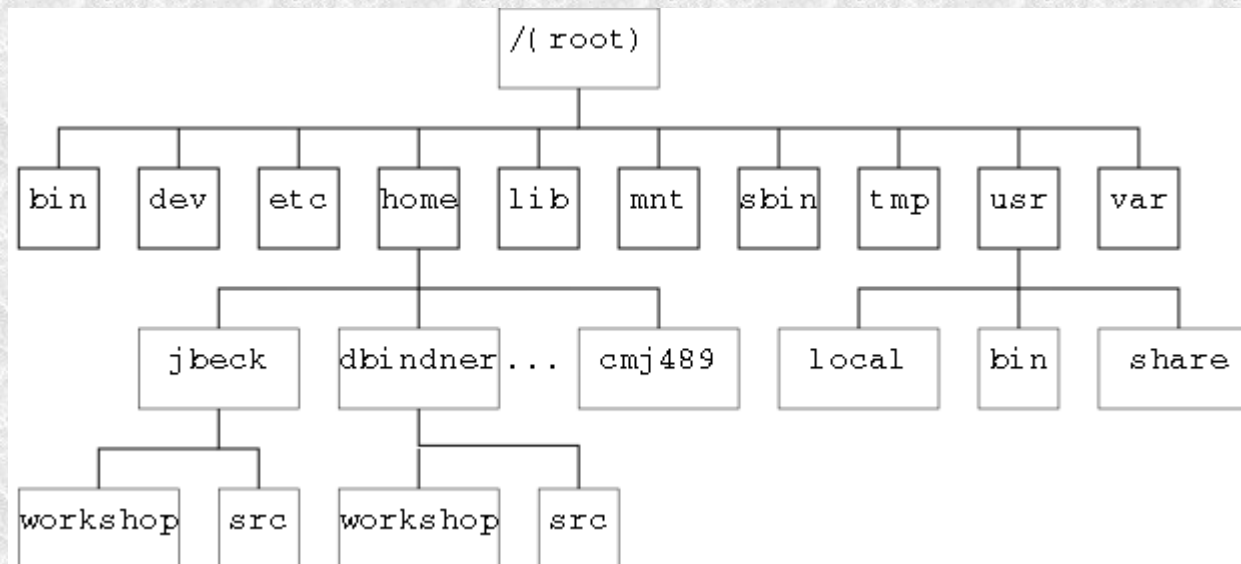
- Good
 - Diskettes relatively inexpensive media
 - Floppy Drives on most existing computers
 - Linux reads most Floppy Diskette formats
- Bad
 - Low capacity
 - Floppy Drives NOT always in laptops
 - Frequent Microsoft Virus carrier
 - Mounting issues

Mounting Filesystems

- By design, UNIX and Unix-like filesystems all flow from the “/” or the “root” point.
- Devices can be attached to a point along that structure. These are directories, know as “mount points”.
- *Usually implies that you know name of device, name of mount point and type of filesystem.*

*nix Filesystem Structure

- Often described as an inverted tree
- No single standard mount point



*nix Mount requirement

- Usual advice is that *floppy diskettes always have to be **mounted** under *nix*
- That means that *the floppy diskettes must be unmounted with **umount** before removal*
 - *Failure to do so correctly can corrupt data!*
 - *TIP: Always watch the lights!*
- Most books blindly say little more

Mount Not Always Required

Mount NOT always needed:

- 1 Floppies not mounted before formatting
- 2 NOT necessary with some commands:
dd, file, tar
- 3 The **mttools** commands simulate the MS DOS/Windows environment
- 4 **automount** - somewhat reliable in doing mount and umount for you
- 5 *BTW: CDROM music disks are NOT mounted*

Information on fd

- man page

- **fd** (4) - floppy disk device

- 3.5 inch high density device files:

-	Name	Capac.	Cyl.	Sect.	Heads	Base minor #
-	-----					
-	fdnH360	360K	40	9	2	12
-	fdnH720	720K	80	9	2	16
-	fdnH820	820K	82	10	2	52
-	fdnH830	830K	83	10	2	68
-	fdnH1440	1440K	80	18	2	28
-	fdnH1600	1600K	80	20	2	124
-	fdnH1680	1680K	80	21	2	44

Device names

The following figure shows the meaning of the different parts of the name of a floppy device:

```
+----- /dev: directory for devices
|  +----- fd: floppy disk device prefix
|  | +----- 0: floppy drive #0 (A:)(0-1 typical,
|  | |           0 to 7 possible)
|  | | +-- 3.5" drive:(use d for 5.25"double density drives,
|  | ||           and h for 5.25" high density drives,
|  | ||           u for 3.5" drive of any density)
|  | || +---- 1440: Capacity (in KB) of format
|  | || |           (usually between 360 and 3920)
/dev/fd0u1440
```

Mounting file systems

- man pages:
 - **mount** (2) - mount and unmount filesystems
 - **mount** (8) - mount a file system
 - **umount** (8) - unmount file systems
 - *Note spelling of **umount** command!!!*

Mounting Floppies

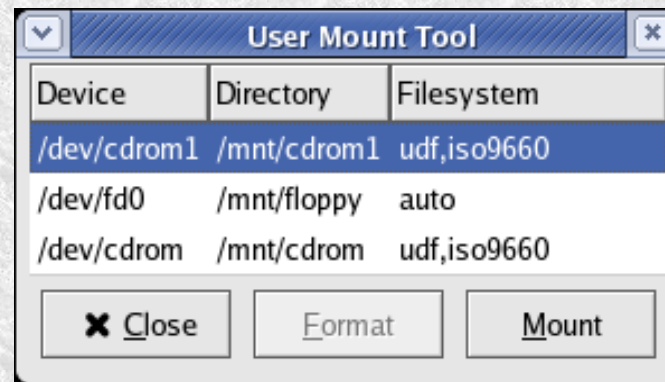
- Usual CLI process is to mount first
 - # mount /dev/fd0 /mnt/floppy**
 - # mount -t vfat /dev/fd0 /floppy**
 - # ls /floppy**
- Not required with mtools commands
 - CLI syntax similar to MS DOS
 - # mdir A:**
 - # mlabel A:**

Information on mtools

- man page
 - **mtools** (1) - utilities to access DOS disks in Unix
- (p)info documentation
 - **mtools** (1) - utilities to access DOS disks in Unix
- Various mtool commands:
 - **mattrib, mbadbblocks, mcat, mcd, mclasserase, mcopy, mdel, mdeltree, mdir, mdoctorfat, mdu, mformat, minfo, mlabel, mmd, mmount, mpartition, mrd, mread, mmove, mren, mshowfat, mtoolstest, mtype, mwrite, mzip**

Mounting examples

- GUI: Fedora Core 2
 - Launch  System Tools  Disk Management



- *TIP: Always watch the lights!*

Mounting examples

- CLI example
 - To find out what is mounted:
 - # mount (lists mounted filesystems)
 - # mount -l (lists with filesystem labels)
 - You may have to be superuser or root
 - # mount /dev/fd0 /mnt/floppy
 - You may have to specify filesystem type
 - # mount -t vfat /dev/fd0 /mnt/floppy
 - *TIP: Always watch the lights!!!*

Automounting

- man pages
 - **autofs** (5) - Format of the automounter maps
 - **automount** (8) - configure mount points for autofs
 - /etc/auto.master [**auto**] (5) - Master Map for autofs
 - /etc/rc.d/init.d/autofs [**autofs**] (8) - Control Script
 - **amd** (8) - automatically mount file systems
 - **amq** (8) - automounter query tool
 - **pawd** (1) - print automounter working directory

Formatting Purpose

- Filesystems require formatting of media
- Before:
 - Like natural wilderness
 - Unknown – Don't know what is there
- After:
 - Like plowed field
 - Overgrowth and stumps removed
 - Fenced off bad areas
 - Furrows are made

Formatting With Other O/S

One stage combined process under
MS DOS/Windows

`C:> format A:`

- Does a low-level format & test for bad sectors
- Makes a DOS/Windows filesystem

Formatting With *nix

- Two stages under Linux/Unix

```
# fdformat /dev/fd0u1440
```

- Does a low-level format
- Option to verify & test for bad sectors

```
# mkfs /dev/fd0
```

- NOT always required
- Can make many kinds of filesystems
- GUI tools incorporate both stages
- fdformat to be replaced by superformat

Information on floppy

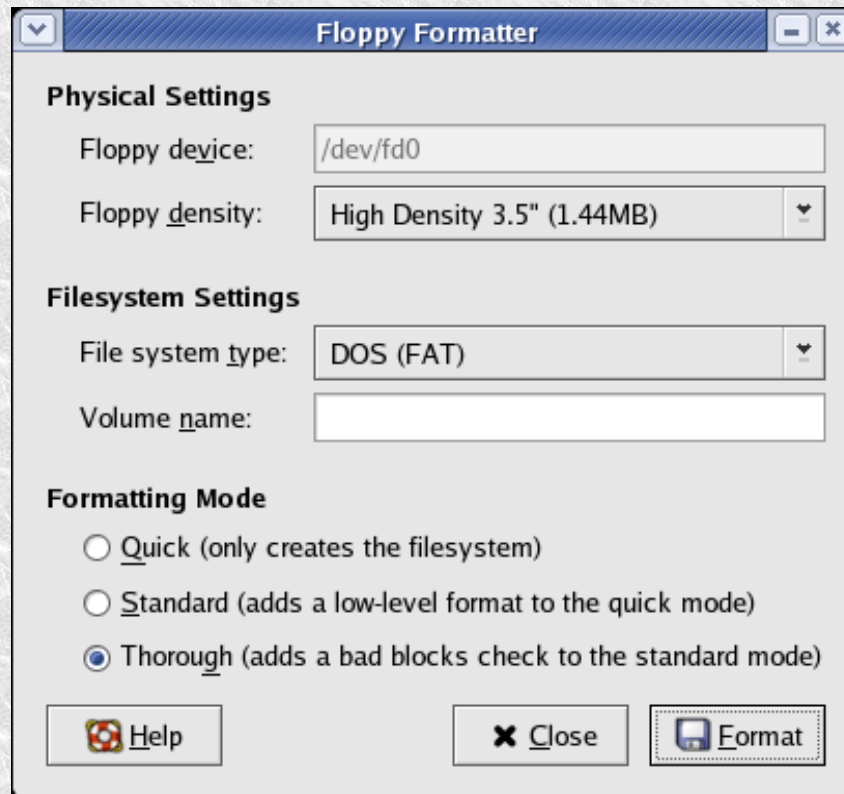
- man page
 - **floppy** (8) - format floppy disks
 - Requires creation of /etc/floppy config file
 -

Information on fdformat

- man page
 - **fdformat** (8) - Low-level formats a floppy disk
 -
- Alternative utility called **superformat**
 - Apparently developed by same developer
 - Supposedly **fdformat** is depreciated
 - Favored **superformat** much more powerful

Formatting example

- GUI: Fedora Core 2
 - Launch  System Tools  Floppy Formatter



Formatting examples

- CLI example
 - You may have to be the superuser - root
 - # fdformat /dev/fd0H1440 (deprecated)
 - or
 - # fdformat /dev/fd0u1440 (preferred)
 - May find bad blocks on media
 - *TIP: Discard any media with bad blocks*

Information on dd

- man page
 - **dd** (1) - convert and copy a file
- (p)info documentation
 - **dd** - Convert and copy a file

Using Archive Image

- Create an exact image from floppy

```
# dd if=/dev/fd0 of=/home/me/disk001.img
```

- Use image just like a floppy

```
# mount -t vfat -o loop /home/me/disk001.img /mnt/floppy
```

Information on file

- man page
 - **file** (1) - determine file type
 - example> \$ file -s /dev/fd0
- man page
 - **magic** (5) - file command's magic number file

Information on tar

- man page
 - **tar** (1) - GNU version of the tar archiving utility
- (p)info documentation
 - **tar**

Using tar

- Using tar on floppy diskette without file system

```
# tar cvf /dev/fd0 *.txt # verbosely create
```

```
# tar tvf /dev/fd0      # verbosely list
```

```
# tar xvf /dev/fd0      # verbosely extract
```

Multi-volume tar Archives

- `tar -Mcvf /dev/fd0 *.txt`
 - verbosely create archive
 - multiple floppy diskettes

*Note: dash **may be** required in front of M*

Information on filesystems [fs]

- man page

filesystems [fs] (5) - Linux filesystem types:

- minix, ext, ext2, ext3, xia, msdos, umsdos, vfat, proc, nfs, iso9660, hpfs, sysv, smb, ncpfs

Information on mkfs

- man pages
 - **mkfs** (8) - build a Linux file system
 - **mkdosfs [mkfs]** (8) - create an MS-DOS file system under Linux
 - **mke2fs [mkfs]** (8) - create an ext2/3 filesystem

Determine filesystem

- With **dd** command:

```
# dd if=/dev/fd0 count=1 bs=512 | file -
```

```
# dd if=/dev/fd0 count=1 bs=512 | \
hexdump -c | less
```

- With **file** command:

```
# file -s /dev/fd0
```

Example Results

```
$ file -s /dev/fd0
```

```
/dev/fd0: PC formatted floppy with no filesystem
```

```
$ file -s /dev/fd0
```

```
/dev/fd0: data
```

```
$ file -s /dev/fd0
```

```
/dev/fd0: x86 boot sector
```

```
$ file -s /dev/fd0
```

```
/dev/fd0: x86 boot sector, code offset 0x34, OEM-ID "IBM 3.3", root entries  
224, sectors 2880 (volumes <=32 MB) , sectors/FAT 9, dos < 4.0 BootSector (0x0)
```

```
$ file -s /dev/fd0
```

```
/dev/fd0: x86 boot sector, code offset 0x3c, OEM-ID "'y}JJIHC", root entries  
224, sectors 2880 (volumes <=32 MB) , sectors/FAT 9, hidden sectors
```

```
1866661888, sectors 1769109872 (volumes >32 MB) , physical drive 0x67,
```

```
reserved 0x68 dos < 4.0 BootSector (0x74)
```

References On Your System

- Read the source on your own system

`file: ///usr/src/linux-2.6.../Documentation/devices.txt`

`file: ///usr/src/linux-2.6.../Doc.../magic-number.txt`

`file: ///usr/src/linux-2.6.../Doc.../filesystems/vfat.txt`

and the other filesystems text files!

- Configuration files

`/etc/fstab`

`/proc/fs` (shows which filesystems supported by kernel)

Wikipedia References

- Floppy disks

http://en.wikipedia.org/wiki/Floppy_disk

- Example Images

http://commons.wikimedia.org/wiki/Floppy_disk

- Floppy Diskette Types

<http://www.computermuseum.li/Testpage/FloppyDisketteTypes.htm>

- Floppy Diskette Brands

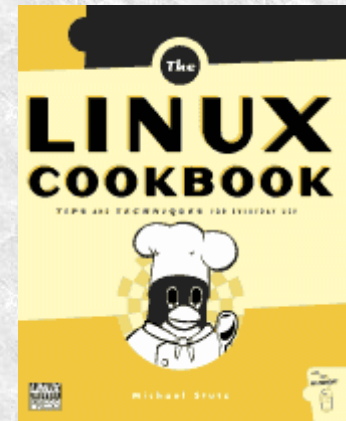
<http://www.computermuseum.li/Testpage/FloppyDisketteBrands.htm>

Other Internet References

- URLs on the Internet
 - Linux: **Rute** User's Tutorial and Exposition
<http://www.icon.co.za/~psheer/rute-home.html>
 - The Linux Cookbook: Tips and Techniques for Everyday Use
<http://dsl.org/cookbook>
 - Fdutils
<http://olympus.het.brown.edu/doc/fdutils/Fdutils.htm>

References

- Book:
 - *The Linux Cookbook: Tips and Techniques for Everyday Use*
 - AUTHOR: Michael Stutz
 - PUBLISHER: No Starch Press
 - PUBLISHED: August, 2001
 - LIST: \$29.95
 - ISBN: 1-886411-48-4
 - STLC: 005.432/S937L



References

- Book:

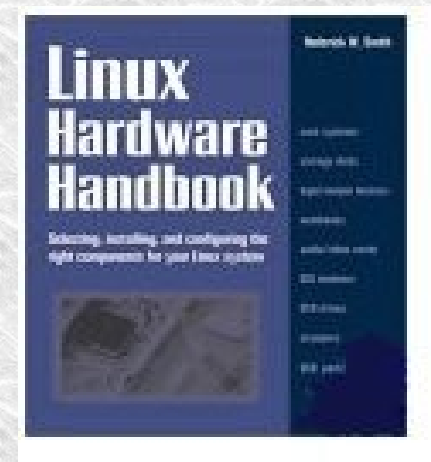
*Linux: **Rute** User's Tutorial and Exposition*

- AUTHOR: Paul Sheer
- PUBLISHER: Prentice Hall
- PUBLISHED: October 2001
- LIST: \$39.99
- ISBN: 0-13-033351-4
- STLC: 005.4469/S541L
- NOTE: Debian & Red Hat, 650pp+cdrom



References

- Book:
 - *Linux Hardware Handbook*
 - *SUBTITLE: Selecting, Installing, & Configuring The Right Components For Your Linux System*
 - AUTHOR: Roderick W. Smith
 - PUBLISHER: SAMS
 - PUBLISHED: July 2000
 - LIST: \$39.99
 - ISBN: 0-6723-1918-7
 - STLC: 631.3916/S658L



References

- Book:
 - *PC Hardware In A Nutshell, 3rd Edition*
 - SUB-TITLE: *A Desktop Quick Reference*
 - AUTHOR1: Robert Bruce Thompson
 - AUTHOR2: Barbara Fritchman Thompson
 - PUBLISHER: O'Reilly
 - PUBLISHED: July 2003
 - LIST: \$39.95
 - ISBN: 0-596-00513-X
 - STLC: N/A



Questions?

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