

Mounting Filesystems

coursera.org/learn/linux-tools-for-developers/supplement/jcCxU/mounting-filesystems

In UNIX-like operating systems, all files are arranged in one big filesystem tree rooted at /. Many different partitions on many different devices may be coalesced together by mounting partitions on various mount points, or directories in the tree.

The full form of the **mount** command is:

```
$ sudo mount [-t type] [-o options] device dir
```

In most cases, the filesystem type can be deduced automatically from the first few bytes of the partition, and default options can be used, so it can be as simple as:

```
$ sudo mount /dev/sda8 /usr/local
```

Most filesystems need to be loaded at boot and the information required to specify mount points, options, devices, etc., is specified in **/etc/fstab**:

```
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c7:/tmp>cat /etc/fstab
#
# /etc/fstab
# Created by anaconda on Thu Jan 15 19:25:00 2015
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
LABEL=RHEL7      /          ext4      defaults    1 1
LABEL=local      /usr/local  ext4      defaults 1 2
LABEL=src         /usr/src    ext4      defaults 1 2
LABEL=pictures    /PICTURES   ext4      defaults 1 2
LABEL=dead        /DEAD       ext4      defaults 1 2
LABEL=dead2       /DEAD2      ext4      defaults 1 2
LABEL=virtual     /VIRTUAL    ext4      defaults 1 2
LABEL=iso_images  /ISO_IMAGES ext4      defaults 1 2
LABEL=audio       /AUDIO      ext4      defaults 1 2
LABEL=vms         /VMS        ext4      defaults 1 2
/usr/src/KERNELS.sqfs /usr/src/KERNELS squashfs loop 0 0

LABEL=SWAP swap          swap      defaults    0 0
#UUID=471dfeba-3ec7-4529-8069-2afe50762c57 / ext4      defaults 1 1
c7:/tmp>
```

Note that in this example, most of the filesystems are mounted by **label**; it is also possible to mount by device name or **UUID**; the following are all equivalent:

```
$ sudo mount /dev/sda2 /boot  
$ sudo mount LABEL=boot /boot  
$ sudo mount -L boot /boot  
$ sudo mount UUID=26d58ee2-9d20-4dc7-b6ab-aa87c3cfb69a /boot  
$ sudo mount -U 26d58ee2-9d20-4dc7-b6ab-aa87c3cfb69a /boot
```

The list of currently mounted filesystems can be seen with:

```
$ sudo mount  
  
/dev/sda5 on / type ext3 (rw)  
proc on /proc type proc (rw)  
sysfs on /sys type sysfs (rw)  
devpts on /dev/pts type devpts (rw,gid=5,mode=620)  
/dev/sda6 on /RHEL6-32 type ext3 (rw)  
/dev/mapper/VGN-local on /usr/local type ext4 (rw)  
/dev/mapper/VGN-tmp on /tmp type ext4 (rw)  
/dev/mapper/VGN-src on /usr/src type ext4 (rw)  
/dev/mapper/VGN-virtual on /VIRTUAL type ext4 (rw)  
/dev/mapper/VGN-beagle on /BEAGLE type ext4 (rw)  
tmpfs on /dev/shm type tmpfs (rw)  
debugfs on /sys/kernel/debug type debugfs (rw)  
/dev/sda1 on /c type fuseblk (rw,allow_other,default_permissions,blksize=4096)  
/usr/local/teaching/FTP/LFT on /var/ftp/pub2 type none (rw,bind)  
/ISO_IMAGES/CENTOS/CentOS-5.5-x86_64-bin-DVD-1of2.iso on /var/ftp/pub  
type iso9660 (rw,loop=/dev/loop0)  
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw)  
/dev/sda2 on /boot type ext3 (rw)
```

If a directory is used as a mount point, its previous contents are hidden under the newly mounted filesystem. A given partition can be mounted in more than one place and changes are effective in all locations.

You can also mount NFS (Network File Systems) as in:

```
$ sudo mount 192.168.1.100:/var/ftp/pub /mnt
```