LINUX FOUNDATION

TRAINING

Mounting Filesystems Automatically at Boot Time

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Overview

All devices connected to a Linux system are listed under the /dev directory, including hard disks and partitions. Linux operating systems use partitions with file systems by attaching to them. A partition with a filesystem in the /dev directory, like /dev/sdb1, is attached to a directory in the operating system hierarchy, like /mnt/. This is called mounting: the device is mounted to a directory.

Sometimes it is acceptable to manually mount partitions as they are needed. Often though, a partition was created to be used persistently, and in some cases data stored on the partition may be required to run the system. Instead of mounting partitions manually every time they are needed, it makes more sense to mount them automatically as part of the operating system's boot up operations.

Key Ideas

Mount: The mount command is used to attach a filesystem to a directory in the operating system's file hierarchy.

/etc/fstab: The fstab file in the /etc/ directory governs how filesystems are mounted during the operating system's boot operations. It contains a list of partitions, mount points, and mount options.

UUID: Partitions have a unique identifier called a UUID to provide a stable way of addressing them. The names of devices under /dev is subject to change if, for example, additional hard disks are connected to the system. UUIDs provide a consistent way of addressing partitions.

blkid: The blkid command displays all disk partitions and their associated UUIDs.

mkdir: The mkdir command creates directories.

Example Scenario

Configure the operating system to mount a partition at boot time under the /mnt/test1 directory.

Now Do It

1. Use the mkdir to create a new directory called test1 under /mnt/
   # mkdir /mnt/test1

2. Use the blkid command to find the UUID of the partition to be automatically mounted at boot time.
   # blkid /dev/sdb1 (This command assumes that the partition to be automatically mounted at boot time is /dev/sdb1)

3. Edit and save the /etc/fstab file, adding a new line for the new automatic mounting instruction.
   Replace this with the output of /dev/sdb1.
   [UUID=83fc0954-e4ae-4b00-836e-b2122a54c967]
   /mnt/test1 ext4 defaults 0 0
4. Use the mount command with the -a option to mount all entries in the /etc/fstab file. # mount -a
5. Use the mount command to list the currently mounted partitions.
   # mount

If you remember nothing else...

Use partition UUIDs rather than /dev/ locations to address partitions. Using the default mount options for a partition's filesystem type is useful for many use cases, but is not optimized for specific use cases.

Answer Key

1. No output on successful directory creation.

2. Output from blkid

```
# blkid
[root@localhost ~]# blkid
/dev/sda1: UUID="806d7cef-a6ad-4579-93f5-1454ca3ff3b6" TYPE="xfs"
/dev/sda2: UUID="wumB6V-RrRS-txHN-WKIw-mMMo-Gt2w-xeofAu" TYPE="LVM2_
member"
/dev/sdb1: UUID="83fc0954-e4ae-4b00-836e-b2122a54c967" TYPE="ext4"
PARTLABEL="test" PARTUUID="1cb23cb9-f7da-4cc9-bcb1-5c621d612c71"
```

3. Explanation of the new line in /etc/fstab

```
UUID=83fc0954-e4ae-4b00-836e-b2122a54c967 /mnt/test1    ext4    defaults    0 0
```

The automatic mount instruction is a line with 6 columns. /dev/sdb1 on /mnt/test1 type ext4 (rw,relatime,seclabel,data=ordered)

PIECE OF FSTAB ENTRY (COLUMN)	EXPLAINATION
UUID=83FC0954-E4AE-4B00-836E-B2122A54C967	Column 1: Partition, use the partition's unique identifier that you discovered in step 2
/MNT/TEST1	Column 2: Mount point, /mnt/test1 is the directory where the file system will be mounted. The directory is separated from the UUID by a space.
EXT4	Column 3: Filesystem type, ext4 is the type of filesystem on the partition. The filesystem type is separated from the mount directory by a tab.
DEFAULTS	Column 4: Mount options, defaults uses the default options for the specified filesystem type. Mount options are separated from filesystem type by a tab.
0	Column 5: Dump order: specifies how the dump backup utility should handle this partition, 0. means skip. Dump order is separated from the mount options by a tab.
0	Column 6: The value in this column indicates whether this partition will be examined for errors by the fsck utility during boot. A value of 0 means fsck should ignore it. FSCK stands for File System CheckK.

4. Mount all entries:

   # mount -a

   If the command is successful, not output is displayed.

5. List mounted filesystems

   # mount

   [root@localhost ~]# mount

   proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)

   ...

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