

TRAINING

Formatting Filesystems

Overview

Before a disk partition can be used to store files, a system for placing and finding files must be applied to the partition. There are numerous different filesystems, with features attractive in different use cases. Windows operating systems have for years used the New Technology File System (NTFS), the Mac OSX operating system uses Hierarchical File System Plus (HFS+), and the fourth extended filesystem (ext4) is commonly used by Linux operating systems.

Key Ideas

Partition: Hard disks are partitioned before use. A partition can include a part of a disk, or the whole disk.

Filesystem: A way of organising data on a hard disk so it can be located and manipulated by the operating systems.

Ext4: The fourth extended filesystem. This filesystem is used by default in many Linux operating system.

Journalling: A journalling file system keeps track of changes made to the files it contains. This decreases recovery time in case of hard disk issues, and decreases the likelihood of file system corruption. The ext4 filesystem is a journalling filesystem.

mkfs: The mkfs command creates a filesystem on a disk partition.

lsblk: The lsblk command displays block devices, which includes hard disks and hard disk partitions.

Example Scenario

You have added a new hard disk to your server, and created a partition on it for data storage. Format the partition with the ext4 filesystem.

Now Do It

1. Use the lsblk command to list all the block devices attached to your server.
2. Use the mkfs command to create an ext4 filesystem on the empty partition.
3. Use the parted command's interactive mode to verify that the filesystem has been created.

If you remember nothing else...

Filesystems are created on partitions rather than directly on disks. It is possible to write a new filesystem over top of an existing filesystem; this causes data loss.

Answer Key

1. List block devices:

```
# lsblk
[root@localhost ~]# lsblk
[root@localhost ~]# lsblk
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda                  8:0    0   8G  0 disk
|-- sda1              8:1    0 500M  0 part /boot
|-- sda2              8:2    0 7.5G  0 part
    |-- centos-swap 253:0    0 820M  0 lvm  [SWAP]
    |-- centos-root 253:1    0 6.7G  0 lvm  /
sdb                  8:16    0 100.1M  0 disk
|-- sdb1              8:17    0   99M  0 part
```

2. Write an ext4 filesystem to an empty partition:

```
# mkfs.ext4 /dev/sdb1
mke2fs 1.42.9 (28-Dec-2013)
...
Writing superblocks and filesystem accounting information: done
```

3. Verify filesystem creation:

```
# parted /dev/sdb
(parted) print
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 105MB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:
Number Start End Size File system Name Flags
1 1049kB 105MB 104MB ext4 test
```



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