

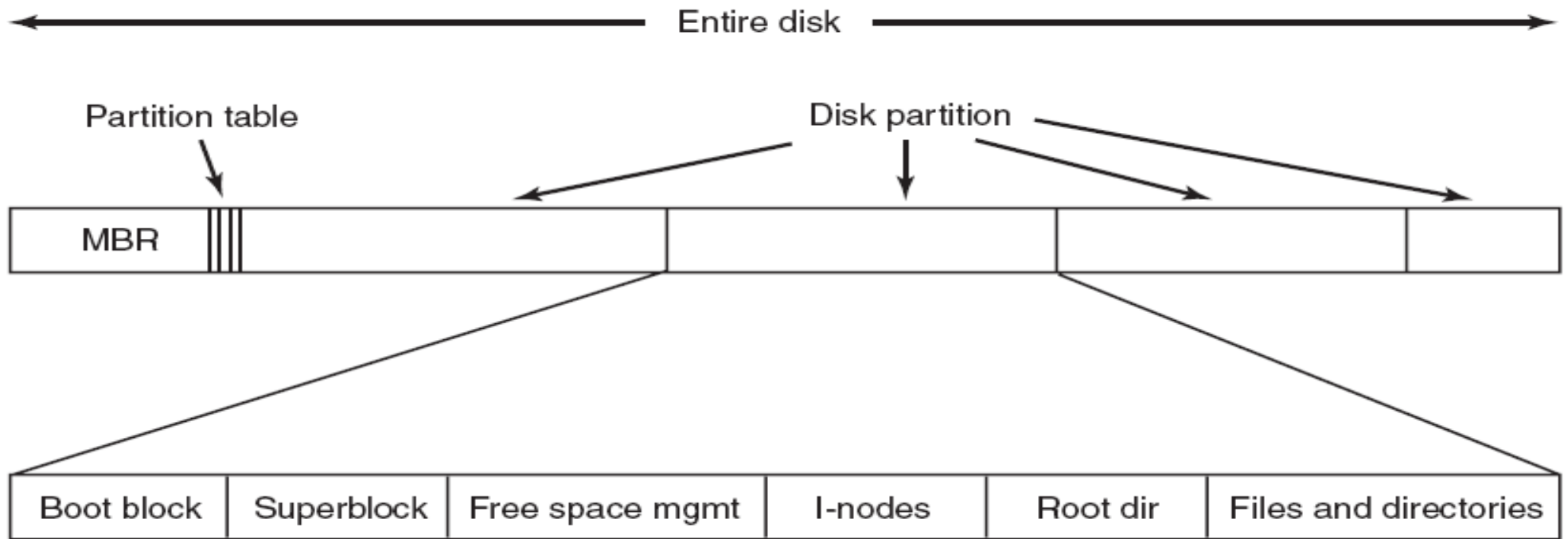
fat32

Under Ubuntu

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# Disk & Partition



# Windows' Partition

- 分区内的第一个扇区
  - 引导扇区
- 分区内的第二个扇区
  - 文件系统信息扇区 FSINFO
- 保留的其它扇区
- FAT1 表的若干扇区
- FAT2 表的若干扇区
- 数据区的若干扇区

# The First Section of Partition

```
albert@alosvm: ~/jos2016fall/fat32
00000000 EB 58 90 6D 6B 66 73 2E 66 61 74 00 02 01 20 00 .X.mkfs.fat...
00000010 02 00 00 00 00 F8 00 00 20 00 40 00 00 00 00 00 .....@.....
00000020 00 90 01 00 14 03 00 00 00 00 00 00 02 00 00 00 .....
00000030 01 00 06 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000040 80 00 29 45 51 9E 71 4F 53 32 30 31 37 46 41 54 ..)EQ.q0S2017FAT
00000050 33 32 46 41 54 33 32 20 20 20 0E 1F BE 77 7C AC 32FAT32 ...w|.
00000060 22 C0 74 0B 56 B4 0E BB 07 00 CD 10 5E EB F0 32 ".t.V.....^..2
00000070 E4 CD 16 CD 19 EB FE 54 68 69 73 20 69 73 20 6E .....This is n
00000080 6F 74 20 61 20 62 6F 6F 74 61 62 6C 65 20 64 69 ot a bootable di
00000090 73 6B 2E 20 20 50 6C 65 61 73 65 20 69 6E 73 65 sk. Please inse
000000A0 72 74 20 61 20 62 6F 6F 74 61 62 6C 65 20 66 6C rt a bootable fl
000000B0 6F 70 70 79 20 61 6E 64 0D 0A 70 72 65 73 73 20 oppy and..press
000000C0 61 6E 79 20 6B 65 79 20 74 6F 20 74 72 79 20 61 any key to try a
000000D0 67 61 69 6E 20 2E 2E 2E 20 0D 0A 00 00 00 00 00 gain ...
000000E0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000000F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000100 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000110 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000120 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000130 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000140 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000150 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000160 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000170 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000180 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000190 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000001A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000001B0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000001C0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000001D0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000001E0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000001F0 00 00 00 00 00 00 00 00 00 00 00 00 00 55 AA .....U.
--- usbfat32d.img --0x0/0x3200000-----
```

# The First Section of Partition

0x00~0x02: 3字节, 跳转指令

0x03~0x0A: 8字节, 文件系统标志和版本号

\*0x0B~0x0C: 2字节, 每扇区字节数, 512 (0x0200:512)

\*0x0D~0x0D: 1字节, 每簇扇区数, 1 (0x01)

\*0x0E~0x0F: 2字节, 保留扇区数, 32 (0x0020), 即FAT1的起始地址为相对第32扇区

\*0x10~0x10: 1字节, FAT表个数, 2(0x02)

0x11~0x12: 2字节, FAT32必须等于0, FAT12/FAT16为根目录中目录的个数

0x13~0x14: 2字节, FAT32必须等于0, FAT12/FAT16为扇区总数

0x15~0x15: 1字节, 哪种存储介质, 0xF8标准值, 可移动存储介质, 常用的 0xF0

0x16~0x17: 2字节, FAT32必须为0, FAT12/FAT16为一个FAT表所占的扇区数

\*0x18~0x19: 2字节, 每磁道扇区数, 只对由磁头和柱面每分割为若干磁道的存储介质有效, 32 (0x0020)

\*0x1A~0x1B: 2字节, 磁头数, 只对特殊的介质才有效, 64 (0x0040)

\*0x1C~0x1F: 4字节, EBR分区之前所隐藏的扇区数, 0, 与MBR中0x1C6开始的4个字节数值相等

# The First Section of Partition

0x20~0x23: 4字节, 文件系统总扇区数, 102400 (0x 00 01 90 00) ,  $102400 * 512 = 50\text{MB}$

\*0x24~0x27: 4字节, 每个FAT表占用扇区数, 788 (0x00000314)

0x28~0x29: 2字节, 标记, 此域FAT32 特有

\*0x2A~0x2B: 2字节, FAT32版本号0.0, FAT32特有

\***0x2C~0x2F: 4字节, 根目录所在第一个簇的簇号, 2 (0x00000002)**

\*0x30~0x31: 2字节, FSINFO (文件系统信息扇区) 扇区号1 (0x0001), 该扇区为操作系统提供关于空簇总数及下一可用簇的信息

0x32~0x33: 2字节, 备份引导扇区的位置。备份引导扇区总是位于文件系统的6号扇区 (0x0006)

0x34~0x3F: 12字节, 用于以后FAT 扩展使用

0x40~0x40: 1字节, 与FAT12/16 的定义相同, 只不过两者位于启动扇区不同的位置而已

0x41~0x41: 1字节, 与FAT12/16 的定义相同, 只不过两者位于启动扇区不同的位置而已

0x42~0x42: 1字节, 扩展引导标志, 0x29。与FAT12/16 的定义相同, 只不过两者位于启动扇区不同的位置而已

0x43~0x46: 4字节, 卷序列号, 通常为一个随机值

\*0x47~0x51: 11字节, 卷标 (ASCII码), 如果建立文件系统的时候指定了卷标

\*0x52~0x59: 8字节, 文件系统格式的ASCII码, FAT32

0x5A~0x1FD: 90~509共410字节, 未使用

\*0x1FE~0x1FF: 签名标志 "55 AA", 0x1FE:55 0x1FF:AA



# 分区内的第二个扇区： 文件系统信息扇区 FSINFO

```
albert@alosvm: ~/jos2016fall/fat32
00000200  52 52 61 41 00 00 00 00 00 00 00 00 00 00 00 00 RRaA.....
00000210  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000220  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000230  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000240  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000250  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000260  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000270  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000280  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000290  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000002A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000002B0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000002C0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000002D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000002E0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000002F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000300  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000310  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000320  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000330  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000340  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000350  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000360  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000370  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000380  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00000390  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000003A0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000003B0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000003C0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000003D0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
000003E0  00 00 00 00 72 72 41 61 F3 2C 00 00 CE 5C 01 00 ....rrAa.,...\..
000003F0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 55 AA .....U.
--- usbfat32d.img --0x218/0x3200000-----
```

# 分区内的第二个扇区： 文件系统信息扇区 FSINFO

0x00~0x03: 4 个字节, 扩展引导标志 " 0x52 0x52 0x61 0x41"RRaA

0x04~0x1E3: 480 个字节, 未使用

0x1E4~0x1E7: 4 个字节, FSINFO 签名 " 0x72 0x72 0x41 0x61" rrAa

\*0x1E8~0x1EB: 4 个字节, 文件系统的空簇数, 11507 ( 0x00002CF3 )

\*0x1EC~0x1EF: 4 个字节, 下一可用簇号 89294 ( 0xCE 0x5C 0x01 0x00: 0x00015CCE )

0x1F0~0x1FD: 14 个字节, 未使用

0x1FE~0x1FF: 2 个字节, " 55 AA" 标志



End