

Mr. FS

Multi Rack File System

A Simple OpenComputers FS

ALL DATA IS LITTLE ENDIAN, including data structures in blocks

So inodes are stored like

[16, 17, 18, ...][0, 1, 2, 3, ...][volume end]

Notes:

All fields marked as Reserved must be 0

Structure:

0-511	SuperBlock
512+	Data blocks
~	Free space
~ last	Inodes

SuperBlock(LBA 0)

0-3	4	'MrFS' magic string, encoded in EBCDIC (D4h 99h C6h E2h)
4	1	$2^{\text{(This number)}}$ = Logical block size
5	1	Volume ID, first 0
6	1	Reserved, MUST be 0
7	1	Number of volumes
8	1	Reserved, MUST be 0
9-16	8	Number of all blocks(Filesystem size)
17-24	8	Data blocks allocated on this volume(incl superblock)
25-32	8	First free data block on this volume
33-40	8	Used data+inode blocks(actually used space)
41-48	8	Inode blocks allocated on this volume
49-56	8	First free inode on this device(inode ID w/o VolID)
57-68	16	Filesystem UUID

~256		Zeros/Reserved
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Inodes

Inodes grow from top to bottom, inode 0 on volume 0 is root directory.

Inode id is $volumeID + n \ll 8$, where n is inode number from top of data volume

0	1	Inode type
1-2	2	Permissions, flags
3-4	2	User ID
5-6	2	Group ID
7	1	Reserved
8-15	8	Size in bytes
16-19	4	Allocated blocks
20-27	8	Direct pointer 0
28-35	8	Direct pointer 1
36-43	8	Singly indirect pointer
44-51	8	Triple indirect pointer
~63	12	Reserved, must be 0

Inode types:

0 - Free/None

1 - Directory

2 - File

Permissions/flags:

9 bits - 3 bits user, 3 bits group, 3 bits all

MSB->LSB

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Note that for free inode the data pointer block points next free inode or 0 when there is need to allocate next inode block. Inode 0 is root directory so it's always occupied.

Data pointer blocks:

Just blocks of pointers

Pointer:

1	Volume ID
2-7	LBA

Pointer that points to block 0(superblock) is terminating file

Directory:

Contains directory entries(Inodes + name info)

Directory Entry:

0-7	Inode
8	Name length
9+	Name

File:

Just file data

Free block/inode:

1	Type
8	Next LBA

Types:

0 - Free block at the top/bottom(unused, unreliable)

1 - Free block inside other blocks, points to next free blocks