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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'statfs.2' command

\$ man statfs.2

STATFS(2) Linux Programmer's Manual STATFS(2)

NAME

statfs, fstatfs - get filesystem statistics

SYNOPSIS

```
#include <sys/vfs.h> /* or <sys/statfs.h> */  
  
int statfs(const char *path, struct statfs *buf);  
  
int fstatfs(int fd, struct statfs *buf);
```

DESCRIPTION

The statfs() system call returns information about a mounted filesystem. path is the pathname of any file within the mounted filesystem. buf is a pointer to a statfs structure defined approximately as follows:

```
struct statfs {  
    __fsword_t f_type; /* Type of filesystem (see below) */  
    __fsword_t f_bsize; /* Optimal transfer block size */  
    fsblkcnt_t f_blocks; /* Total data blocks in filesystem */  
    fsblkcnt_t f_bfree; /* Free blocks in filesystem */  
    fsblkcnt_t f_bavail; /* Free blocks available to  
                          unprivileged user */  
    fsfilcnt_t f_files; /* Total inodes in filesystem */  
    fsfilcnt_t f_ffree; /* Free inodes in filesystem */  
    fsid_t f_fsid; /* Filesystem ID */  
    __fsword_t f_namelen; /* Maximum length of filenames */
```

```

__fsword_t f_fsize; /* Fragment size (since Linux 2.6) */
__fsword_t f_flags; /* Mount flags of filesystem
                    (since Linux 2.6.36) */
__fsword_t f_spare[xxx];
                    /* Padding bytes reserved for future use */
};

```

The following filesystem types may appear in f_type:

```

ADFS_SUPER_MAGIC    0xadf5
AFFS_SUPER_MAGIC    0xadff
AFS_SUPER_MAGIC     0x5346414f
ANON_INODE_FS_MAGIC 0x09041934 /* Anonymous inode FS (for
                pseudofiles that have no name;
                e.g., epoll, signalfd, bpf) */
AUTOFS_SUPER_MAGIC  0x0187
BDEVFS_MAGIC        0x62646576
BEFS_SUPER_MAGIC    0x42465331
BFS_MAGIC           0x1badface
BINFMNTFS_MAGIC     0x42494e4d
BPF_FS_MAGIC        0xcafe4a11
BTRFS_SUPER_MAGIC   0x9123683e
BTRFS_TEST_MAGIC    0x73727279
CGROUP_SUPER_MAGIC  0x27e0eb /* Cgroup pseudo FS */
CGROUP2_SUPER_MAGIC 0x63677270 /* Cgroup v2 pseudo FS */
CIFS_MAGIC_NUMBER   0xff534d42
CODA_SUPER_MAGIC    0x73757245
COH_SUPER_MAGIC     0x012ff7b7
CRAMFS_MAGIC        0x28cd3d45
DEBUGFS_MAGIC       0x64626720
DEVFS_SUPER_MAGIC   0x1373 /* Linux 2.6.17 and earlier */
DEVPTS_SUPER_MAGIC  0x1cd1
ECRYPTFS_SUPER_MAGIC 0xf15f
EFIVARFS_MAGIC      0xde5e81e4
EFS_SUPER_MAGIC     0x00414a53

```

EXT_SUPER_MAGIC 0x137d /* Linux 2.0 and earlier */
EXT2_OLD_SUPER_MAGIC 0xef51
EXT2_SUPER_MAGIC 0xef53
EXT3_SUPER_MAGIC 0xef53
EXT4_SUPER_MAGIC 0xef53
F2FS_SUPER_MAGIC 0xf2f52010
FUSE_SUPER_MAGIC 0x65735546
FUTEXFS_SUPER_MAGIC 0xbad1dea /* Unused */
HFS_SUPER_MAGIC 0x4244
HOSTFS_SUPER_MAGIC 0x00c0ffee
HPFS_SUPER_MAGIC 0xf995e849
HUGETLBFS_MAGIC 0x958458f6
ISOFS_SUPER_MAGIC 0x9660
JFFS2_SUPER_MAGIC 0x72b6
JFS_SUPER_MAGIC 0x3153464a
MINIX_SUPER_MAGIC 0x137f /* original minix FS */
MINIX_SUPER_MAGIC2 0x138f /* 30 char minix FS */
MINIX2_SUPER_MAGIC 0x2468 /* minix V2 FS */
MINIX2_SUPER_MAGIC2 0x2478 /* minix V2 FS, 30 char names */
MINIX3_SUPER_MAGIC 0x4d5a /* minix V3 FS, 60 char names */
MQQUEUE_MAGIC 0x19800202 /* POSIX message queue FS */
MSDOS_SUPER_MAGIC 0x4d44
MTD_INODE_FS_MAGIC 0x11307854
NCP_SUPER_MAGIC 0x564c
NFS_SUPER_MAGIC 0x6969
NILFS_SUPER_MAGIC 0x3434
NSFS_MAGIC 0x6e736673
NTFS_SB_MAGIC 0x5346544e
OCFS2_SUPER_MAGIC 0x7461636f
OPENPROM_SUPER_MAGIC 0x9fa1
OVERLAYFS_SUPER_MAGIC 0x794c7630
PIPEFS_MAGIC 0x50495045
PROC_SUPER_MAGIC 0x9fa0 /* /proc FS */

```

PSTOREFS_MAGIC    0x6165676c
QNX4_SUPER_MAGIC  0x002f
QNX6_SUPER_MAGIC  0x68191122
RAMFS_MAGIC       0x858458f6
REISERFS_SUPER_MAGIC 0x52654973
ROMFS_MAGIC       0x7275
SECURITYFS_MAGIC  0x73636673
SELINUX_MAGIC     0xf97cff8c
SMACK_MAGIC       0x43415d53
SMB_SUPER_MAGIC   0x517b
SMB2_MAGIC_NUMBER 0xfe534d42
SOCKFS_MAGIC      0x534f434b
SQUASHFS_MAGIC    0x73717368
SYSFS_MAGIC       0x62656572
SYSV2_SUPER_MAGIC 0x012ff7b6
SYSV4_SUPER_MAGIC 0x012ff7b5
TMPFS_MAGIC       0x01021994
TRACEFS_MAGIC     0x74726163
UDF_SUPER_MAGIC   0x15013346
UFS_MAGIC         0x00011954
USBDEVICE_SUPER_MAGIC 0x9fa2
V9FS_MAGIC        0x01021997
VXFS_SUPER_MAGIC  0xa501fcf5
XENFS_SUPER_MAGIC 0xabba1974
XENIX_SUPER_MAGIC 0x012ff7b4
XFS_SUPER_MAGIC   0x58465342
_XIAFS_SUPER_MAGIC 0x012fd16d /* Linux 2.0 and earlier */

```

Most of these MAGIC constants are defined in `/usr/include/linux/magic.h`, and some are hardcoded in kernel sources.

The `f_flags` field is a bit mask indicating mount options for the filesystem. It contains zero or more of the following bits:

`ST_MANDLOCK`

Mandatory locking is permitted on the filesystem (see `fcntl(2)`).

ST_NOATIME

Do not update access times; see mount(2).

ST_NODEV

Disallow access to device special files on this filesystem.

ST_NODIRATIME

Do not update directory access times; see mount(2).

ST_NOEXEC

Execution of programs is disallowed on this filesystem.

ST_NOSUID

The set-user-ID and set-group-ID bits are ignored by exec(3) for executable files on this filesystem

ST_RDONLY

This filesystem is mounted read-only.

ST_RELATIME

Update atime relative to mtime/ctime; see mount(2).

ST_SYNCHRONOUS

Writes are synced to the filesystem immediately (see the description of O_SYNC in open(2)).

ST_NOSYMFOLLOW (since Linux 5.10)

Symbolic links are not followed when resolving paths; see mount(2).

Nobody knows what f_fsid is supposed to contain (but see below).

Fields that are undefined for a particular filesystem are set to 0.

fstatfs() returns the same information about an open file referenced by descriptor fd.

RETURN VALUE

On success, zero is returned. On error, -1 is returned, and errno is set appropriately.

ERRORS

EACCES (statfs()) Search permission is denied for a component of the path prefix of path. (See also path_resolution(7).)

EBADF (fstatfs()) fd is not a valid open file descriptor.

EFAULT buf or path points to an invalid address.

EINTR The call was interrupted by a signal; see signal(7).

EIO An I/O error occurred while reading from the filesystem.

ELOOP (statfs()) Too many symbolic links were encountered in translating path.

ENAMETOOLONG

(statfs()) path is too long.

ENOENT (statfs()) The file referred to by path does not exist.

ENOMEM Insufficient kernel memory was available.

ENOSYS The filesystem does not support this call.

ENOTDIR

(statfs()) A component of the path prefix of path is not a directory.

EOVERFLOW

Some values were too large to be represented in the returned struct.

CONFORMING TO

Linux-specific. The Linux statfs() was inspired by the 4.4BSD one (but they do not use the same structure).

NOTES

The `__fsword_t` type used for various fields in the `statfs` structure definition is a glibc internal type, not intended for public use. This leaves the programmer in a bit of a conundrum when trying to copy or compare these fields to local variables in a program. Using unsigned int for such variables suffices on most systems.

The original Linux `statfs()` and `fstatfs()` system calls were not designed with extremely large file sizes in mind. Subsequently, Linux 2.6 added new `statfs64()` and `fstatfs64()` system calls that employ a new structure, `statfs64`. The new structure contains the same fields as the original `statfs` structure, but the sizes of various fields are increased, to accommodate large file sizes. The glibc `statfs()` and `fstatfs64()` wrapper functions transparently deal with the differences.

Some systems have only `<sys/vfs.h>`, other systems also have

<sys/statfs.h>, where the former includes the latter. So it seems including the former is the best choice.

LSB has deprecated the library calls `statfs()` and `fstatfs()` and tells us to use `statvfs(2)` and `fstatvfs(2)` instead.

The `f_fsid` field

Solaris, Irix and POSIX have a system call `statvfs(2)` that returns a struct `statvfs` (defined in <sys/statvfs.h>) containing an unsigned long `f_fsid`. Linux, SunOS, HP-UX, 4.4BSD have a system call `statfs()` that returns a struct `statfs` (defined in <sys/vfs.h>) containing a `fsid_t` `f_fsid`, where `fsid_t` is defined as `struct { int val[2]; }`. The same holds for FreeBSD, except that it uses the include file <sys/mount.h>. The general idea is that `f_fsid` contains some random stuff such that the pair `(f_fsid,ino)` uniquely determines a file. Some operating systems use (a variation on) the device number, or the device number combined with the filesystem type. Several operating systems restrict giving out the `f_fsid` field to the superuser only (and zero it for unprivileged users), because this field is used in the filehandle of the filesystem when NFS-exported, and giving it out is a security concern. Under some operating systems, the `fsid` can be used as the second argument to the `statfs(2)` system call.

BUGS

From Linux 2.6.38 up to and including Linux 3.1, `fstatfs()` failed with the error `ENOSYS` for file descriptors created by `pipe(2)`.

SEE ALSO

`stat(2)`, `statvfs(3)`, `path_resolution(7)`

COLOPHON

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