NAME

getdents, getdents64 – get directory entries

SYNOPSIS

int getdents(unsigned int *fd***, struct linux_dirent ***dirp***,**
unsigned int *count***);**
int getdents64(unsigned int *fd***, struct linux_dirent64 ***dirp***,**
unsigned int *count***);**

Note: There are no glibc wrappers for these system calls; see NOTES.

DESCRIPTION

These are not the interfaces you are interested in. Look at **readdir**(3) for the POSIX-conforming C library interface. This page documents the bare kernel system call interfaces.

getdents()

The system call **getdents**() reads several *linux_dirent* structures from the directory referred to by the open file descriptor *fd* into the buffer pointed to by *dirp*. The argument *count* specifies the size of that buffer.

The *linux_dirent* structure is declared as follows:

```
struct linux_dirent {
    unsigned long  d_ino;     /* Inode number */
    unsigned long  d_off;     /* Offset to next linux_dirent */
    unsigned short d_reclen;  /* Length of this linux_dirent */
    char           d_name[];  /* Filename (null-terminated) */
                      /* length is actually (d_reclen - 2 -
                         offsetof(struct linux_dirent, d_name)) */
    /*
    char           pad;       // Zero padding byte
    char           d_type;    // File type (only since Linux
                              // 2.6.4); offset is (d_reclen - 1)
    */
}
```

d_ino is an inode number. *d_off* is the distance from the start of the directory to the start of the next *linux_dirent*. *d_reclen* is the size of this entire *linux_dirent*. *d_name* is a null-terminated filename.

d_type is a byte at the end of the structure that indicates the file type. It contains one of the following values (defined in <*dirent.h*>):

DT_BLK This is a block device.

DT_CHR This is a character device.

DT_DIR This is a directory.

DT_FIFO This is a named pipe (FIFO).

DT_LNK This is a symbolic link.

DT_REG This is a regular file.

DT_SOCK This is a UNIX domain socket.

DT_UNKNOWN
The file type is unknown.

The *d_type* field is implemented since Linux 2.6.4. It occupies a space that was previously a zero-filled padding byte in the *linux_dirent* structure. Thus, on kernels up to and including 2.6.3, attempting to access this field always provides the value 0 (**DT_UNKNOWN**).

Currently, only some filesystems (among them: Btrfs, ext2, ext3, and ext4) have full support for returning the file type in *d_type*. All applications must properly handle a return of **DT_UNKNOWN**.

getdents64()

The original Linux **getdents**() system call did not handle large filesystems and large file offsets. Consequently, Linux 2.4 added **getdents64**(), with wider types for the *d_ino* and *d_off* fields. In addition, **getdents64**() supports an explicit *d_type* field.

The **getdents64**() system call is like **getdents**(), except that its second argument is a pointer to a buffer containing structures of the following type:

```
struct linux_dirent64 {
    ino64_t        d_ino;    /* 64-bit inode number */
    off64_t        d_off;    /* 64-bit offset to next structure */
    unsigned short d_reclen; /* Size of this dirent */
    unsigned char  d_type;   /* File type */
    char           d_name[]; /* Filename (null-terminated) */
};
```

RETURN VALUE

On success, the number of bytes read is returned. On end of directory, 0 is returned. On error, −1 is returned, and *errno* is set appropriately.

ERRORS

EBADF
Invalid file descriptor *fd*.

EFAULT
Argument points outside the calling process's address space.

EINVAL
Result buffer is too small.

ENOENT
No such directory.

ENOTDIR
File descriptor does not refer to a directory.

CONFORMING TO

SVr4.

NOTES

Glibc does not provide a wrapper for these system calls; call them using **syscall**(2). You will need to define the *linux_dirent* or *linux_dirent64* structure yourself. However, you probably want to use **readdir**(3) instead.

These calls supersede **readdir**(2).

EXAMPLE

The program below demonstrates the use of **getdents**(). The following output shows an example of what we see when running this program on an ext2 directory:

```
$ ./a.out /testfs/
--------------- nread=120 ---------------
inode#    file type  d_reclen  d_off   d_name
       2  directory    16         12  .
       2  directory    16         24  ..
      11  directory    24         44  lost+found
      12  regular      16         56  a
  228929  directory    16         68  sub
   16353  directory    16         80  sub2
  130817  directory    16       4096  sub3
```

Program source

```
#define _GNU_SOURCE
#include <dirent.h>     /* Defines DT_* constants */
#include <fcntl.h>
#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>
#include <sys/stat.h>
#include <sys/syscall.h>

#define handle_error(msg) \
        do { perror(msg); exit(EXIT_FAILURE); } while (0)

struct linux_dirent {
    long           d_ino;
    off_t          d_off;
    unsigned short d_reclen;
    char           d_name[];
};

#define BUF_SIZE 1024

int
main(int argc, char *argv[])
{
    int fd, nread;
    char buf[BUF_SIZE];
    struct linux_dirent *d;
    int bpos;
    char d_type;

    fd = open(argc > 1 ? argv[1] : ".", O_RDONLY | O_DIRECTORY);
    if (fd == -1)
        handle_error("open");

    for ( ; ; ) {
        nread = syscall(SYS_getdents, fd, buf, BUF_SIZE);
        if (nread == -1)
            handle_error("getdents");

        if (nread == 0)
            break;

        printf("--------------- nread=%d ---------------\n", nread);
        printf("inode#    file type  d_reclen  d_off   d_name\n");
        for (bpos = 0; bpos < nread;) {
            d = (struct linux_dirent *) (buf + bpos);
            printf("%8ld  ", d->d_ino);
            d_type = *(buf + bpos + d->d_reclen - 1);
            printf("%-10s ", (d_type == DT_REG) ?  "regular" :
                             (d_type == DT_DIR) ?  "directory" :
                             (d_type == DT_FIFO) ? "FIFO" :
                             (d_type == DT_SOCK) ? "socket" :
```

```
                                (d_type == DT_LNK) ?  "symlink" :
                                (d_type == DT_BLK) ?  "block dev" :
                                (d_type == DT_CHR) ?  "char dev" : "???");
                    printf("%4d %10lld  %s\n", d->d_reclen,
                            (long long) d->d_off, d->d_name);
                    bpos += d->d_reclen;
                }
            }

            exit(EXIT_SUCCESS);
        }
```

SEE ALSO

readdir(2), **readdir**(3), **inode**(7)

COLOPHON

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