

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_SOCKET) ? "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

This page is part of release 5.02 of the Linux *man-pages* project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at <https://www.kernel.org/doc/man-pages/>.