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

$ man readlink.2

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

NAME

readlink, readlinkat - read value of a symbolic link

SYNOPSIS

```
#include <unistd.h>

ssize_t readlink(const char *pathname, char *buf, size_t bufsiz);

#include <fcntl.h>           /* Definition of AT_* constants */

#include <unistd.h>

ssize_t readlinkat(int dirfd, const char *pathname,
                   char *buf, size_t bufsiz);
```

Feature Test Macro Requirements for glibc (see feature_test_macros(7)):

readlink():

_XOPEN_SOURCE >= 500 || _POSIX_C_SOURCE >= 200112L

|| /* Glibc versions <= 2.19: */ _BSD_SOURCE

readlinkat():

Since glibc 2.10:

_POSIX_C_SOURCE >= 200809L

Before glibc 2.10:

_ATFILE_SOURCE

DESCRIPTION

readlink() places the contents of the symbolic link pathname in the buffer buf, which has size bufsiz. readlink() does not append a null byte to buf. It will (silently) truncate the contents (to a length of

bufsiz characters), in case the buffer is too small to hold all of the contents.

readlinkat()

The readlinkat() system call operates in exactly the same way as read? link(), except for the differences described here.

If the pathname given in pathname is relative, then it is interpreted relative to the directory referred to by the file descriptor dirfd (rather than relative to the current working directory of the calling process, as is done by readlink() for a relative pathname).

If pathname is relative and dirfd is the special value AT_FDCWD, then pathname is interpreted relative to the current working directory of the calling process (like readlink()).

If pathname is absolute, then dirfd is ignored.

Since Linux 2.6.39, pathname can be an empty string, in which case the call operates on the symbolic link referred to by dirfd (which should have been obtained using open(2) with the O_PATH and O_NOFOLLOW flags).

See openat(2) for an explanation of the need for readlinkat().

RETURN VALUE

On success, these calls return the number of bytes placed in buf. (If the returned value equals bufsiz, then truncation may have occurred.)

On error, -1 is returned and errno is set to indicate the error.

ERRORS

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

EFAULT buf extends outside the process's allocated address space.

EINVAL bufsiz is not positive.

EINVAL The named file (i.e., the final filename component of pathname)
is not a symbolic link.

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

ELOOP Too many symbolic links were encountered in translating the
pathname.

ENAMETOOLONG
A pathname, or a component of a pathname, was too long.

ENOENT The named file does not exist.

ENOMEM Insufficient kernel memory was available.

ENOTDIR

A component of the path prefix is not a directory.

The following additional errors can occur for readlinkat():

EBADF dirfd is not a valid file descriptor.

ENOTDIR

pathname is relative and dirfd is a file descriptor referring to a file other than a directory.

VERSIONS

readlinkat() was added to Linux in kernel 2.6.16; library support was added to glibc in version 2.4.

CONFORMING TO

readlink(): 4.4BSD (readlink() first appeared in 4.2BSD), POSIX.1-2001, POSIX.1-2008.

readlinkat(): POSIX.1-2008.

NOTES

In versions of glibc up to and including glibc 2.4, the return type of readlink() was declared as int. Nowadays, the return type is declared as ssize_t, as (newly) required in POSIX.1-2001.

Using a statically sized buffer might not provide enough room for the symbolic link contents. The required size for the buffer can be ob? tained from the stat.st_size value returned by a call to lstat(2) on the link. However, the number of bytes written by readlink() and read? linkat() should be checked to make sure that the size of the symbolic link did not increase between the calls. Dynamically allocating the buffer for readlink() and readlinkat() also addresses a common porta? bility problem when using PATH_MAX for the buffer size, as this con? stant is not guaranteed to be defined per POSIX if the system does not have such limit.

Glibc notes

On older kernels where readlinkat() is unavailable, the glibc wrapper function falls back to the use of readlink(). When pathname is a rela?

tive pathname, glibc constructs a pathname based on the symbolic link in /proc/self/fd that corresponds to the dirfd argument.

EXAMPLES

The following program allocates the buffer needed by readlink() dynami? cally from the information provided by lstat(2), falling back to a buf? fer of size PATH_MAX in cases where lstat(2) reports a size of zero.

```
#include <sys/types.h>
#include <sys/stat.h>
#include <limits.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
int
main(int argc, char *argv[])
{
    struct stat sb;
    char *buf;
    ssize_t nbytes, bufsiz;
    if (argc != 2) {
        fprintf(stderr, "Usage: %s <pathname>\n", argv[0]);
        exit(EXIT_FAILURE);
    }
    if (lstat(argv[1], &sb) == -1) {
        perror("lstat");
        exit(EXIT_FAILURE);
    }
    /* Add one to the link size, so that we can determine whether
       the buffer returned by readlink() was truncated. */
    bufsiz = sb.st_size + 1;
    /* Some magic symlinks under (for example) /proc and /sys
       report 'st_size' as zero. In that case, take PATH_MAX as
       a "good enough" estimate. */
    if (sb.st_size == 0)
```

```
            bufsiz = PATH_MAX;
        buf = malloc(bufsiz);
        if (buf == NULL) {
            perror("malloc");
            exit(EXIT_FAILURE);
        }
        nbytes = readlink(argv[1], buf, bufsiz);
        if (nbytes == -1) {
            perror("readlink");
            exit(EXIT_FAILURE);
        }
        printf("'%s' points to '%.*s'\n", argv[1], (int) nbytes, buf);
        /* If the return value was equal to the buffer size, then the
           the link target was larger than expected (perhaps because the
           target was changed between the call to lstat() and the call to
           readlink()). Warn the user that the returned target may have
           been truncated. */
        if (nbytes == bufsiz)
            printf("(Returned buffer may have been truncated)\n");
        free(buf);
        exit(EXIT_SUCCESS);
    }
```

SEE ALSO

readlink(1), lstat(2), stat(2), symlink(2), realpath(3), path_resolu? tion(7), symlink(7)

COLOPHON

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