



## ***Rocky Enterprise Linux 9.2 Manual Pages on command 'splice.2'***

**C:\>man splice.2**

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

### NAME

splice - splice data to/from a pipe

### SYNOPSIS

```
#define _GNU_SOURCE        /* See feature_test_macros(7) */  
  
#include <fcntl.h>  
  
ssize_t splice(int fd_in, loff_t *off_in, int fd_out,  
              loff_t *off_out, size_t len, unsigned int flags);
```

### DESCRIPTION

splice() moves data between two file descriptors without copying between kernel address space and user address space. It transfers up to len bytes of data from the file descriptor fd\_in to the file descriptor fd\_out, where one of the file descriptors must refer to a pipe.

The following semantics apply for fd\_in and off\_in:

- \* If fd\_in refers to a pipe, then off\_in must be NULL.
- \* If fd\_in does not refer to a pipe and off\_in is NULL, then bytes are read from fd\_in starting from the file offset, and the file offset is adjusted appropriately.
- \* If fd\_in does not refer to a pipe and off\_in is not NULL, then off\_in must point to a buffer which specifies the starting offset from which bytes will be read from fd\_in; in this case, the file offset of fd\_in is not changed.

Analogous statements apply for fd\_out and off\_out.

The flags argument is a bit mask that is composed by ORing together zero or more of the following values:

#### SPLICE\_F\_MOVE

Attempt to move pages instead of copying. This is only a hint to the kernel: pages may still be copied if the kernel cannot move the pages from the pipe, or if the pipe buffers don't refer to full pages. The initial implementation of this flag was buggy: therefore starting in Linux 2.6.21 it is a no-op (but is still permitted in a splice() call); in the future, a correct implementation may be restored.

#### SPLICE\_F\_NONBLOCK

Do not block on I/O. This makes the splice pipe operations nonblocking, but splice() may nevertheless block because the file descriptors that are spliced to/from may block (unless they have the O\_NONBLOCK flag set).

#### SPLICE\_F\_MORE

More data will be coming in a subsequent splice. This is a helpful hint when the fd\_out refers to a socket (see also the description of MSG\_MORE in send(2), and the description of TCP\_CORK in tcp(7)).

#### SPLICE\_F\_GIFT

Unused for splice(); see vmsplice(2).

#### RETURN VALUE

Upon successful completion, splice() returns the number of bytes spliced to or from the pipe.

A return value of 0 means end of input. If fd\_in refers to a pipe, then this means that there was no data to transfer, and it would not make sense to block because there are no writers connected to the write end of the pipe.

On error, splice() returns -1 and errno is set to indicate the error.

#### ERRORS

EAGAIN SPLICE\_F\_NONBLOCK was specified in flags or one of the file descriptors had been marked as nonblocking (O\_NONBLOCK), and the operation would block.

EBADF One or both file descriptors are not valid, or do not have proper read-write mode.

EINVAL The target filesystem doesn't support splicing.

EINVAL The target file is opened in append mode.

EINVAL Neither of the file descriptors refers to a pipe.

EINVAL An offset was given for nonseekable device (e.g., a pipe).

EINVAL `fd_in` and `fd_out` refer to the same pipe.

ENOMEM Out of memory.

ESPIPE Either `off_in` or `off_out` was not NULL, but the corresponding file descriptor refers to a pipe.

## VERSIONS

The `splice()` system call first appeared in Linux 2.6.17; library support was added to glibc in version 2.5.

## CONFORMING TO

This system call is Linux-specific.

## NOTES

The three system calls `splice()`, `vmsplice(2)`, and `tee(2)`, provide user-space programs with full control over an arbitrary kernel buffer, implemented within the kernel using the same type of buffer that is used for a pipe. In overview, these system calls perform the following tasks:

`splice()` moves data from the buffer to an arbitrary file descriptor, or vice versa, or from one buffer to another.

`tee(2)` "copies" the data from one buffer to another.

`vmsplice(2)` "copies" data from user space into the buffer.

Though we talk of copying, actual copies are generally avoided. The kernel does this by implementing a pipe buffer as a set of reference-counted pointers to pages of kernel memory. The kernel creates "copies" of pages in a buffer by creating new pointers (for the output buffer) referring to the pages, and increasing the reference counts for the pages: only pointers are copied, not the pages of the buffer.

In Linux 2.6.30 and earlier, exactly one of `fd_in` and `fd_out` was required to be a pipe. Since Linux 2.6.31, both arguments may refer to pipes.

## EXAMPLE

See `tee(2)`.

## SEE ALSO

`copy_file_range(2)`, `sendfile(2)`, `tee(2)`, `vmsplice(2)`, `pipe(7)`

## COLOPHON

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