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

$ man lseek.2

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

NAME

lseek - reposition read/write file offset

SYNOPSIS

#include <sys/types.h>

#include <unistd.h>

off_t lseek(int fd, off_t offset, int whence);

DESCRIPTION

lseek() repositions the file offset of the open file description asso? ciated with the file descriptor fd to the argument offset according to the directive whence as follows:

SEEK_SET

The file offset is set to offset bytes.

SEEK_CUR

The file offset is set to its current location plus offset bytes.

SEEK_END

The file offset is set to the size of the file plus offset bytes.

lseek() allows the file offset to be set beyond the end of the file (but this does not change the size of the file). If data is later written at this point, subsequent reads of the data in the gap (a "hole") return null bytes ('\0') until data is actually written into

the gap.

Seeking file data and holes

Since version 3.1, Linux supports the following additional values for whence:

SEEK_DATA

Adjust the file offset to the next location in the file greater than or equal to offset containing data. If offset points to data, then the file offset is set to offset.

SEEK_HOLE

Adjust the file offset to the next hole in the file greater than or equal to offset. If offset points into the middle of a hole, then the file offset is set to offset. If there is no hole past offset, then the file offset is adjusted to the end of the file (i.e., there is an implicit hole at the end of any file).

In both of the above cases, lseek() fails if offset points past the end of the file.

These operations allow applications to map holes in a sparsely allo? cated file. This can be useful for applications such as file backup tools, which can save space when creating backups and preserve holes, if they have a mechanism for discovering holes.

For the purposes of these operations, a hole is a sequence of zeros that (normally) has not been allocated in the underlying file storage. However, a filesystem is not obliged to report holes, so these opera? tions are not a guaranteed mechanism for mapping the storage space ac? tually allocated to a file. (Furthermore, a sequence of zeros that ac? tually has been written to the underlying storage may not be reported as a hole.) In the simplest implementation, a filesystem can support the operations by making SEEK_HOLE always return the offset of the end of the file, and making SEEK_DATA always return offset (i.e., even if the location referred to by offset is a hole, it can be considered to consist of data that is a sequence of zeros).

The _GNU_SOURCE feature test macro must be defined in order to obtain the definitions of SEEK_DATA and SEEK_HOLE from <unistd.h>.

The SEEK_HOLE and SEEK_DATA operations are supported for the following filesystems:

* Btrfs (since Linux 3.1)
* OCFS (since Linux 3.2)
* XFS (since Linux 3.5)
* ext4 (since Linux 3.8)
* tmpfs(5) (since Linux 3.8)
* NFS (since Linux 4.5)
* FUSE (since Linux 4.5)
* GFS2 (since Linux 4.15)

RETURN VALUE

Upon successful completion, lseek() returns the resulting offset location as measured in bytes from the beginning of the file. On error, the value (off_t) -1 is returned and errno is set to indicate the error.

ERRORS

EBADF fd is not an open file descriptor.

EINVAL whence is not valid. Or: the resulting file offset would be negative, or beyond the end of a seekable device.

ENXIO whence is SEEK_DATA or SEEK_HOLE, and offset is beyond the end of the file, or whence is SEEK_DATA and offset is within a hole at the end of the file.

EOVERFLOW

The resulting file offset cannot be represented in an off_t.

ESPIPE fd is associated with a pipe, socket, or FIFO.

CONFORMING TO

POSIX.1-2001, POSIX.1-2008, SVr4, 4.3BSD.

SEEK_DATA and SEEK_HOLE are nonstandard extensions also present in Solaris, FreeBSD, and DragonFly BSD; they are proposed for inclusion in the next POSIX revision (Issue 8).

NOTES

See open(2) for a discussion of the relationship between file descriptors, open file descriptions, and files.

If the O_APPEND file status flag is set on the open file description, then a write(2) always moves the file offset to the end of the file, regardless of the use of lseek().

The off_t data type is a signed integer data type specified by POSIX.1.

Some devices are incapable of seeking and POSIX does not specify which devices must support lseek().

On Linux, using lseek() on a terminal device fails with the error ES? PIPE.

SEE ALSO

dup(2), fallocate(2), fork(2), open(2), fseek(3), lseek64(3), posix_fallocate(3)

COLOPHON

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