NAME

madvise – provide advice to VM system

SYNOPSIS

#include <sys/types.h>
#include <sys/mman.h>

int madvise(caddr_t *addr***, size_t** *len***, int** *advice***);**

MT-LEVEL

MT-Safe

DESCRIPTION

madvise( ) advises the kernel that a region of user mapped memory in the range [*addr, addr + len*) will be accessed following a type of pattern. The kernel uses this information to optimize the procedure for manipulating and maintaining the resources associated with the specified mapping range.

Values for *advice* are defined in **<sys/mman.h>** as:

```
#define MADV_NORMAL      0x0   /* No further special treatment */
#define MADV_RANDOM      0x1   /* Expect random page references */
#define MADV_SEQUENTIAL  0x2   /* Expect sequential page references */
#define MADV_WILLNEED    0x3   /* Will need these pages */
#define MADV_DONTNEED    0x4   /* Don't need these pages */
```

MADV_NORMAL
The default system characteristic where accessing memory within the address range causes the system to read data from the mapped file. The kernel reads all data from files into pages which are retained for a period of time as a "cache." System pages can be a scarce resource, so the kernel steals pages from other mappings when needed. This is a likely occurrence, but adversely affects system performance only if a large amount of memory is accessed.

MADV_RANDOM
Tells the kernel to read in a minimum amount of data from a mapped file on any single particular access. If **MADV_NORMAL** is in effect when an address of a mapped file is accessed, the system tries to read in as much data from the file as reasonable, in anticipation of other accesses within a certain locality.

MADV_SEQUENTIAL
Tells the system that addresses in this range are likely to be accessed only once, so the system will free the resources mapping the address range as quickly as possible. This is used in the **cat**(1) and **cp**(1) utilities.

MADV_WILLNEED
Tells the system that a certain address range is definitely needed so the kernel will start reading the specified range into memory. This can benefit programs wanting to minimize the time needed to access memory the first time, as the kernel would need to read in from the file.

MADV_DONTNEED
Tells the kernel that the specified address range is no longer needed, so the system starts to free the resources associated with the address range.

madvise( ) should be used by programs with specific knowledge of their access patterns over a memory object, such as a mapped file, to increase system performance.

RETURN VALUES

madvise( ) returns:

0 on success.

–1 on failure and sets **errno** to indicate the error.

ERRORS

EINVAL *addr* is not a multiple of the page size as returned by **sysconf**(3C).

The length of the specified address range is less than or equal to 0, or the advice was invalid.

EIO An I/O error occurred while reading from or writing to the file system.

ENOMEM Addresses in the range [*addr*, *addr* + *len*) are outside the valid range for the address space of a process, or specify one or more pages that are not mapped.

ESTALE Stale nfs file handle.

SEE ALSO

cat(1), **cp**(1), **mmap**(2), **sysconf**(3C)