



Rocky Enterprise Linux 9.2 Manual Pages on command 'mcheck.3'

C:\>man mcheck.3

MCHECK(3) Linux Programmer's Manual MCHECK(3)

NAME

mcheck, mcheck_check_all, mcheck_pedantic, mprobe - heap consistency checking

SYNOPSIS

```
#include <mcheck.h>

int mcheck(void (*abortfunc)(enum mcheck_status mstatus));

int mcheck_pedantic(void (*abortfunc)(enum mcheck_status mstatus));

void mcheck_check_all(void);

enum mcheck_status mprobe(void *ptr);
```

DESCRIPTION

The `mcheck()` function installs a set of debugging hooks for the `malloc(3)` family of memory-allocation functions. These hooks cause certain consistency checks to be performed on the state of the heap. The checks can detect application errors such as freeing a block of memory more than once or corrupting the bookkeeping data structures that immediately precede a block of allocated memory.

To be effective, the `mcheck()` function must be called before the first call to `malloc(3)` or a related function. In cases where this is difficult to ensure, linking the program with `-lmcheck` inserts an implicit call to `mcheck()` (with a `NULL` argument) before the first call to a memory-allocation function.

The `mcheck_pedantic()` function is similar to `mcheck()`, but performs checks on all allocated blocks whenever one of the memory-allocation functions is called. This can be very slow!

The `mcheck_check_all()` function causes an immediate check on all allocated blocks.

This call is effective only if `mcheck()` is called beforehand.

If the system detects an inconsistency in the heap, the caller-supplied function pointed to by `abortfunc` is invoked with a single argument, `mstatus`, that indicates what type of inconsistency was detected. If `abortfunc` is `NULL`, a default function prints an error message on `stderr` and calls `abort(3)`.

The `mprobe()` function performs a consistency check on the block of allocated memory pointed to by `ptr`. The `mcheck()` function should be called beforehand (otherwise `mprobe()` returns `MCHECK_DISABLED`).

The following list describes the values returned by `mprobe()` or passed as the `mstatus` argument when `abortfunc` is invoked:

MCHECK_DISABLED (`mprobe()` only)

`mcheck()` was not called before the first memory allocation function was called. Consistency checking is not possible.

MCHECK_OK (`mprobe()` only)

No inconsistency detected.

MCHECK_HEAD

Memory preceding an allocated block was clobbered.

MCHECK_TAIL

Memory following an allocated block was clobbered.

MCHECK_FREE

A block of memory was freed twice.

RETURN VALUE

`mcheck()` and `mcheck_pedantic()` return 0 on success, or -1 on error.

VERSIONS

The `mcheck_pedantic()` and `mcheck_check_all()` functions are available since `glibc 2.2`. The `mcheck()` and `mprobe()` functions are present since at least `glibc 2.0`

ATTRIBUTES

For an explanation of the terms used in this section, see `attributes(7)`.

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?Interface ? Attribute ? Value ?

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?`mcheck()`, `mcheck_pedantic()`, ? Thread safety ? MT-Unsafe race:`mcheck` ?

?mcheck_check_all(), mprobe() ? ? const:malloc_hooks ?

??

CONFORMING TO

These functions are GNU extensions.

NOTES

Linking a program with -lmcheck and using the MALLOC_CHECK_ environment variable (described in mallopt(3)) cause the same kinds of errors to be detected. But, using MALLOC_CHECK_ does not require the application to be relinked.

EXAMPLE

The program below calls mcheck() with a NULL argument and then frees the same block of memory twice. The following shell session demonstrates what happens when running the program:

```
$ ./a.out
About to free
About to free a second time
block freed twice
Aborted (core dumped)
```

Program source

```
#include <stdlib.h>
#include <stdio.h>
#include <mcheck.h>

int
main(int argc, char *argv[])
{
    char *p;

    if (mcheck(NULL) != 0) {
        fprintf(stderr, "mcheck() failed\n");
        exit(EXIT_FAILURE);
    }

    p = malloc(1000);
    fprintf(stderr, "About to free\n");
    free(p);
    fprintf(stderr, "\nAbout to free a second time\n");
```

```
free(p);  
exit(EXIT_SUCCESS);  
}
```

SEE ALSO

malloc(3), mallopt(3), mtrace(3)

COLOPHON

This page is part of release 5.05 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/>.

GNU

2019-03-06

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