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

$ 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 mal? loc(3) family of memory-allocation functions. These hooks cause cer? tain 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 imme? diately 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 diffi?
cult to ensure, linking the program with -lmcheck inserts an implicit
call to mcheck() (with a NULL argument) before the first call to a mem?
ory-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 allo?
cated blocks. This call is effective only if mcheck() is called be?
forehand.

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 al?
located 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 func?
tion 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 at? tributes(7).

Interface	Attribute	Value
mcheck(), mcheck_pedantic(), mcheck_check_all(), mprobe()	Thread safety	MT-Unsafe race:mcheck 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.

EXAMPLES

The program below calls mcheck() with a NULL argument and then frees the same block of memory twice. The following shell session demon? strates 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

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