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C/UNIX mmap array of int



Is it possible to `mmap` file full of integeres as integer array? I mean sth like this (which doesn't work)

given file `tmp.in`

```
1 2 15 1258
```

and similar code to this

```
int fd;  
if ((fd = open("tmp.in", O_RDWR, 0666)) == -1) {  
    err(1, "open");  
}
```

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I'd like to be able call

```
printf("%d\n", map[2]+1);
```

with expected result

```
16
```

I found char mapping using `sscanf` to parse integers, but I need to have numbers in array (and possibly change them and have them saved when `munmap`). Using only POSIX functions and syscalls.

I found sth here [mmap reading stale array of integers from an file](#) but I need file remain readable (so no binary representation). Using `strtok` and `atoi` forces me to use another array, doesn't it? At the end I would need to copy my data back to `map`.

Thanks for help :)

[c](#) [unix](#) [int](#) [mmap](#)

edited May 23 at 12:06



Community ♦

1 1

asked Jan 21 '14 at 9:39



[petrbel](#)

1,065 12 27

2 Answers

No, `mmap` gives you automatic mapping of the file into your address space *as-is*.

That means that a text file will be mapped as characters rather than an array of integers. In other words, `1 2 15 1258` will be mapped (assuming ASCII encoding and UNIX line endings) as:

```
0x31 0x20 0x32 0x20 0x31 0x35 0x20 0x31 0x32 0x35 0x38 0x10
```

If you want to keep the data as textual in the file yet have it binary in memory, you will have to convert it yourself (both directions).

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paxdiablo

550k 139 1090

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Assuming that the input file is text file(not a binary file which can have integer or for that matter any binary data written into it), you file will be mapped as a string having length equal to file-size.

Once this string is mapped into the memory, you can access the individual characters using pointers.

```
I'd like to be able call printf("%d\n", map[2]+1);
```

map[2]+1

This will be just increment the ASCII value of the character.

As per my understanding, you want to map the file into memory and change the values like integers. This is not possible as long as file is a text file.

What I'll suggest is that you map the file into memory, read the characters, do the parsing(in your case look for spaces) and change the character values.

Here's a sample code for you:

```
[root@mohitsingh memoryMap]# cat sample.txt
```

```
12345
```

```
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/stat.h>
```

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

#define FILEPATH "./sample.txt"
#define NUMINTS  (5)
#define FILESIZE (NUMINTS * sizeof(int))

int main(int argc, char *argv[])
{
    int i;
    int fd;
    char *map; /* mmaped array of char */

    fd = open(FILEPATH, O_RDWR);
    if (fd == -1) {
        perror("Error opening file for
reading");
        exit(EXIT_FAILURE);
    }

    map = mmap(0, FILESIZE, PROT_READ|PROT_WRITE, MAP_SHARED, fd, 0);
    if (map == MAP_FAILED) {
        close(fd);
        perror("Error mmaping the file");
        exit(EXIT_FAILURE);
    }

    /* Read the file char-by-char from the mmap
    */
    for (i = 0; i < NUMINTS; ++i) {
        printf("%d: %c\n", i, map[i]);
    }
    /*change the character value
    *Implement your own logic here to change the values as integer
    */
    map[2]='9';
    if (munmap(map, FILESIZE) == -1) {
        perror("Error un-mmapping the
file");
    }
    close(fd);
    return 0;
}
```

[root@mohitsingh memoryMap]# gcc test.c

[root@mohitsingh memoryMap]# ./a.out

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1: 2

2: 3

3: 4

4: 5

```
[root@mohitsingh memoryMap]# cat sample.txt
```

12945

answered Jan 21 '14 at 10:16



MohitSingh

63 6
