虚存作业 4

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代码如下:

```
#include<stdio.h>
#include<stdint.h>
#include<stdlib.h>
#include<sys/mman.h>
#include<signal.h>
#include<setjmp.h>
#include<time.h>

jmp_buf jmp_buffer;
void handler(int signo, siginfo_t * info, void * text);

int main(){
    uint32_t *buffer;
    int errno, base, i;
    struct sigaction act;
    struct sigaction oldact;
    errno = posix_memalign((void**)&buffer, 0x1000, 0x40000);
    errno = mprotect(buffer, 0x40000, PROT_READ);
    printf("Base Address: 0x%x\n", buffer);
    srand((int)time(0));
    base = rand() % 65436;
    //初始化信号集合为空
    sigemptyset(&act.sa_mask);
    act.sa_handler = handler;
    act.sa_flags = SA_SIGINFO;
    sigaction(SIGSEGV, &act, &oldact);

    for(i = 0; i < 100; i ++)      {
        errno = sigsetjmp(jmp_buffer, 1);
        if(!errno)
            buffer[base + i] = 1 + i;
        else
            printf("failed! [%d]\n", i+1);
    }
}

void handler(int signo, siginfo_t * info, void * text){
    printf("Access memory address 0x%x ", (uint32_t)info->si_addr);
    siglongjmp(jmp_buffer, 1);
}
```

运行结果如下:

```
stu@stu-VirtualBox:/mnt/shared$ ./vm
Base Address: 0xb751b000
Access memory address 0xb75405c4 failed! [1]
Access memory address 0xb75405c8 failed! [2]
Access memory address 0xb75405cc failed! [3]
Access memory address 0xb75405d0 failed! [4]
Access memory address 0xb75405d4 failed! [5]
Access memory address 0xb75405d8 failed! [6]
Access memory address 0xb75405dc failed! [7]
Access memory address 0xb75405e0 failed! [8]
Access memory address 0xb75405e4 failed! [9]
Access memory address 0xb75405e8 failed! [10]
Access memory address 0xb75405ec failed! [11]
Access memory address 0xb75405f0 failed! [12]
Access memory address 0xb75405f4 failed! [13]
Access memory address 0xb75405f8 failed! [14]
Access memory address 0xb75405fc failed! [15]
Access memory address 0xb7540600 failed! [16]
Access memory address 0xb7540604 failed! [17]
Access memory address 0xb7540608 failed! [18]
Access memory address 0xb754060c failed! [19]
Access memory address 0xb7540610 failed! [20]
Access memory address 0xb7540614 failed! [21]
Access memory address 0xb7540618 failed! [22]
Access memory address 0xb754061c failed! [23]
Access memory address 0xb7540620 failed! [24]
Access memory address 0xb7540624 failed! [25]
Access memory address 0xb7540628 failed! [26]
Access memory address 0xb754062c failed! [27]
Access memory address 0xb7540630 failed! [28]
Access memory address 0xb7540634 failed! [29]
Access memory address 0xb7540638 failed! [30]
Access memory address 0xb754063c failed! [31]
Access memory address 0xb7540640 failed! [32]
Access memory address 0xb7540644 failed! [33]
Access memory address 0xb7540648 failed! [34]
Access memory address 0xb754064c failed! [35]
Access memory address 0xb7540650 failed! [36]
Access memory address 0xb7540654 failed! [37]
Access memory address 0xb7540658 failed! [38]
Access memory address 0xb754065c failed! [39]
Access memory address 0xb7540660 failed! [40]
Access memory address 0xb7540664 failed! [41]
Access memory address 0xb7540668 failed! [42]
Access memory address 0xb754066c failed! [43]
Access memory address 0xb7540670 failed! [44]
Access memory address 0xb7540674 failed! [45]
Access memory address 0xb7540678 failed! [46]
Access memory address 0xb754067c failed! [47]
Access memory address 0xb7540680 failed! [48]
Access memory address 0xb7540684 failed! [49]
Access memory address 0xb7540688 failed! [50]
Access memory address 0xb7540688 failed! [50]
Access memory address 0xb754068c failed! [51]
Access memory address 0xb7540690 failed! [52]
Access memory address 0xb7540694 failed! [53]
Access memory address 0xb7540698 failed! [54]
Access memory address 0xb754069c failed! [55]
Access memory address 0xb75406a0 failed! [56]
Access memory address 0xb75406a4 failed! [57]
Access memory address 0xb75406a8 failed! [58]
Access memory address 0xb75406ac failed! [59]
Access memory address 0xb75406b0 failed! [60]
Access memory address 0xb75406b4 failed! [61]
Access memory address 0xb75406b8 failed! [62]
Access memory address 0xb75406bc failed! [63]
Access memory address 0xb75406c0 failed! [64]
Access memory address 0xb75406c4 failed! [65]
Access memory address 0xb75406c8 failed! [66]
Access memory address 0xb75406cc failed! [67]
Access memory address 0xb75406d0 failed! [68]
Access memory address 0xb75406d4 failed! [69]
Access memory address 0xb75406d8 failed! [70]
Access memory address 0xb75406dc failed! [71]
Access memory address 0xb75406e0 failed! [72]
Access memory address 0xb75406e4 failed! [73]
Access memory address 0xb75406e8 failed! [74]
Access memory address 0xb75406ec failed! [75]
Access memory address 0xb75406f0 failed! [76]
Access memory address 0xb75406f4 failed! [77]
Access memory address 0xb75406f8 failed! [78]
Access memory address 0xb75406fc failed! [79]
Access memory address 0xb7540700 failed! [80]
Access memory address 0xb7540704 failed! [81]
Access memory address 0xb7540708 failed! [82]
Access memory address 0xb754070c failed! [83]
Access memory address 0xb7540710 failed! [84]
Access memory address 0xb7540714 failed! [85]
Access memory address 0xb7540718 failed! [86]
Access memory address 0xb754071c failed! [87]
Access memory address 0xb7540720 failed! [88]
Access memory address 0xb7540724 failed! [89]
Access memory address 0xb7540728 failed! [90]
Access memory address 0xb754072c failed! [91]
Access memory address 0xb7540730 failed! [92]
Access memory address 0xb7540734 failed! [93]
Access memory address 0xb7540738 failed! [94]
Access memory address 0xb754073c failed! [95]
Access memory address 0xb7540740 failed! [96]
Access memory address 0xb7540744 failed! [97]
Access memory address 0xb7540748 failed! [98]
Access memory address 0xb754074c failed! [99]
Access memory address 0xb7540750 failed! [100]
```