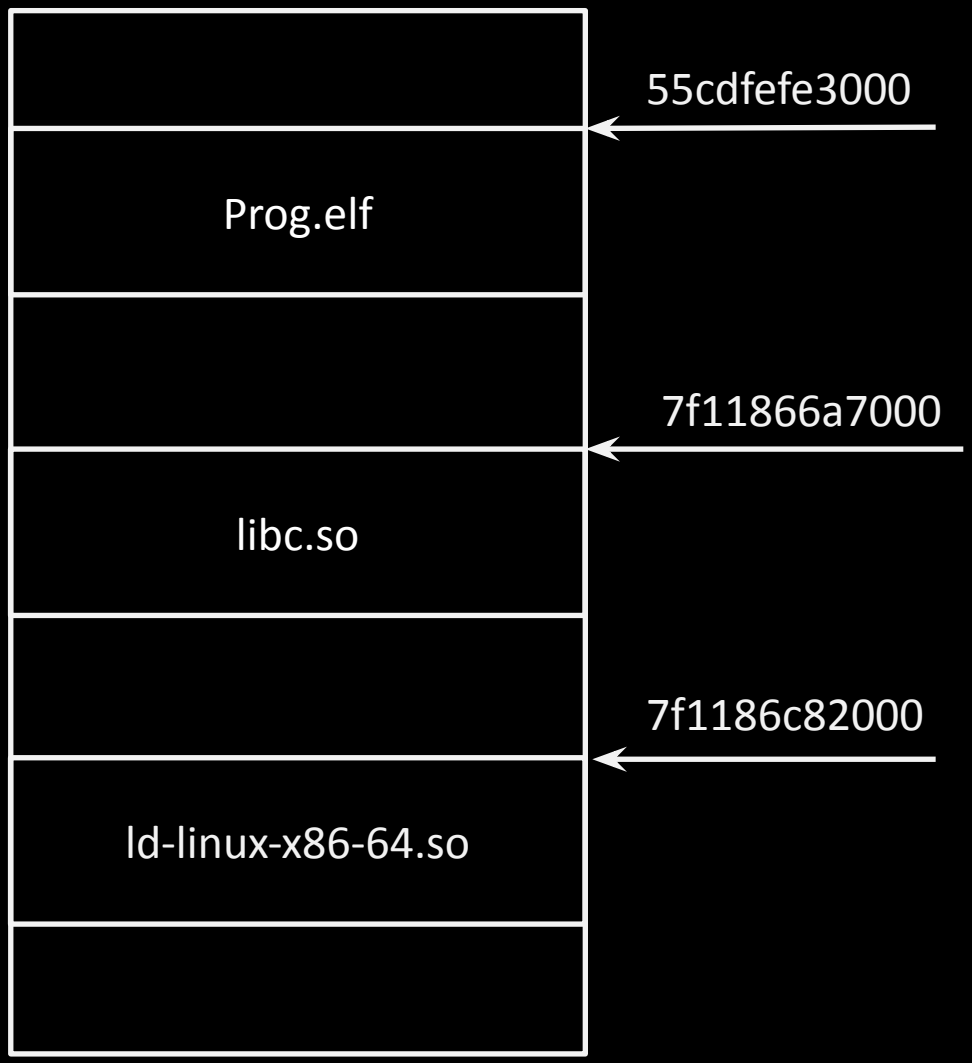
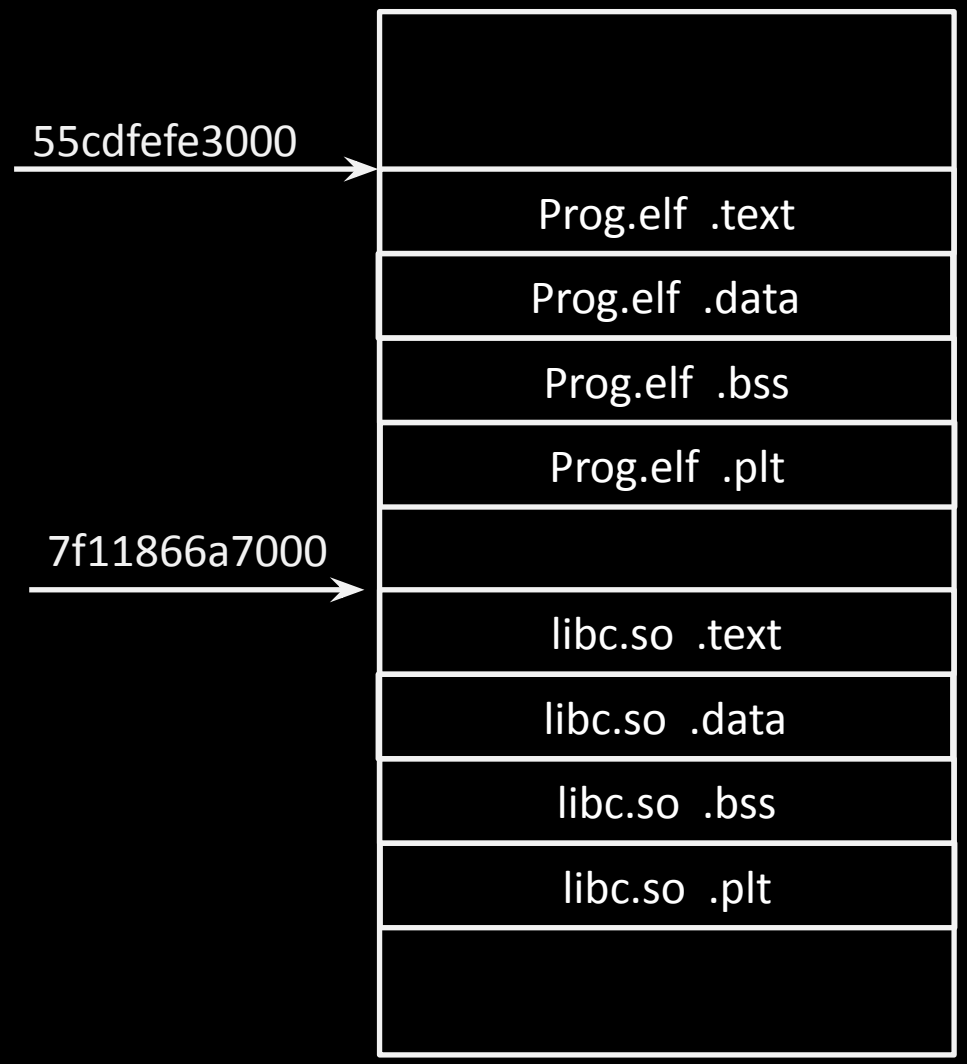
Атака возврата в библиотеку
return to libc attack

What is libc ?


55cdfefe3000
Prog.elf
7f11866a7000
libc.so
7f1186c82000
ld-linux-x86-64.so

What is libc ?


55cdfefe3000
Prog.elf .text
Prog.elf .data
Prog.elf .bss
Prog.elf .plt
7f11866a7000
libc.so .text
libc.so .data
libc.so .bss
libc.so .plt

What is libc ?

```
// You program
main
    call printf
    ret
plt:
    jmp printf
```

```
// libc.so
printf
    ...
    ret

Puts
    ...
    ret
System
    ...
    ret
```

ret2libc

1. We know version of libc.so
2. We know address of libc.so
3. We know any function address at libc.so

ret2libc

```
int main (){
    char buf [16];
    gets(buf);
}
```

ret2libc

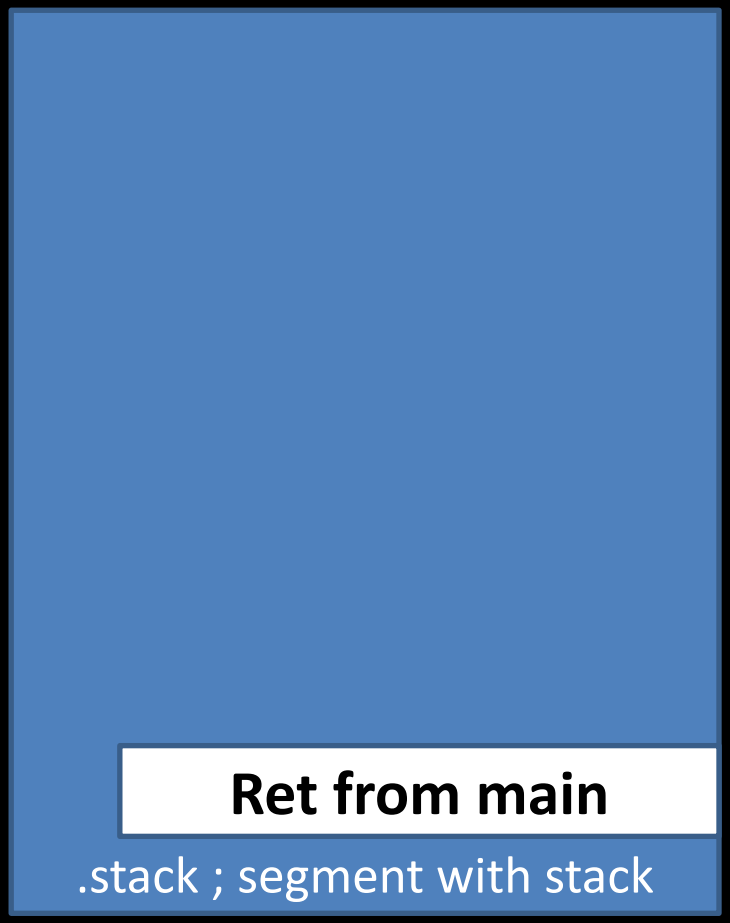
Main:

1. push ebp eip
2. mov ebp, esp
3. sub esp, 16
4. lea edx, buf
5. push edx
6. call gets
7. add esp, 4
8. leave
9. Ret

……

….

10. system :
11. …
12 ret
13. Printf:
14. …
15. ret



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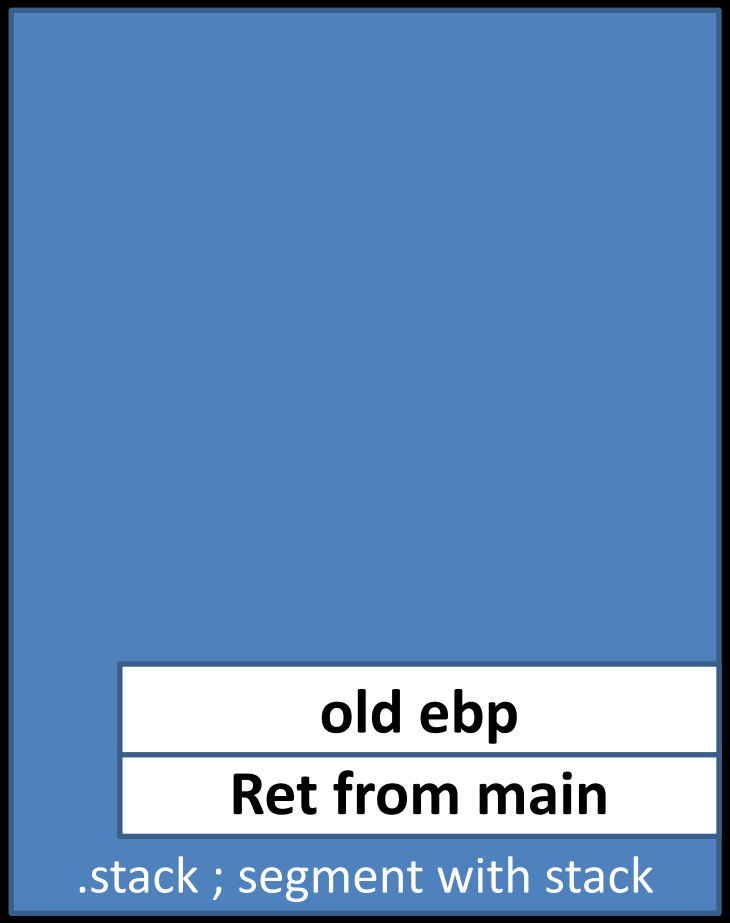

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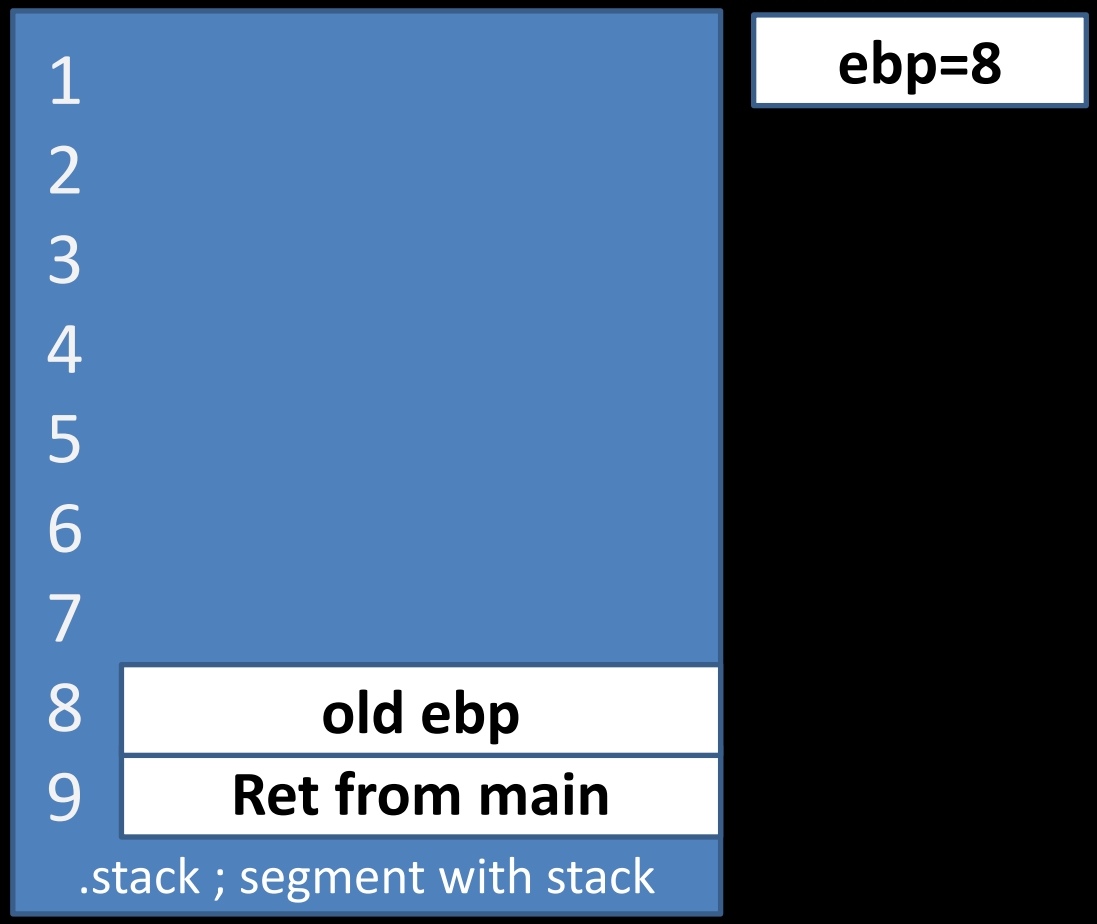

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ebp=8

ret2libc

Main:

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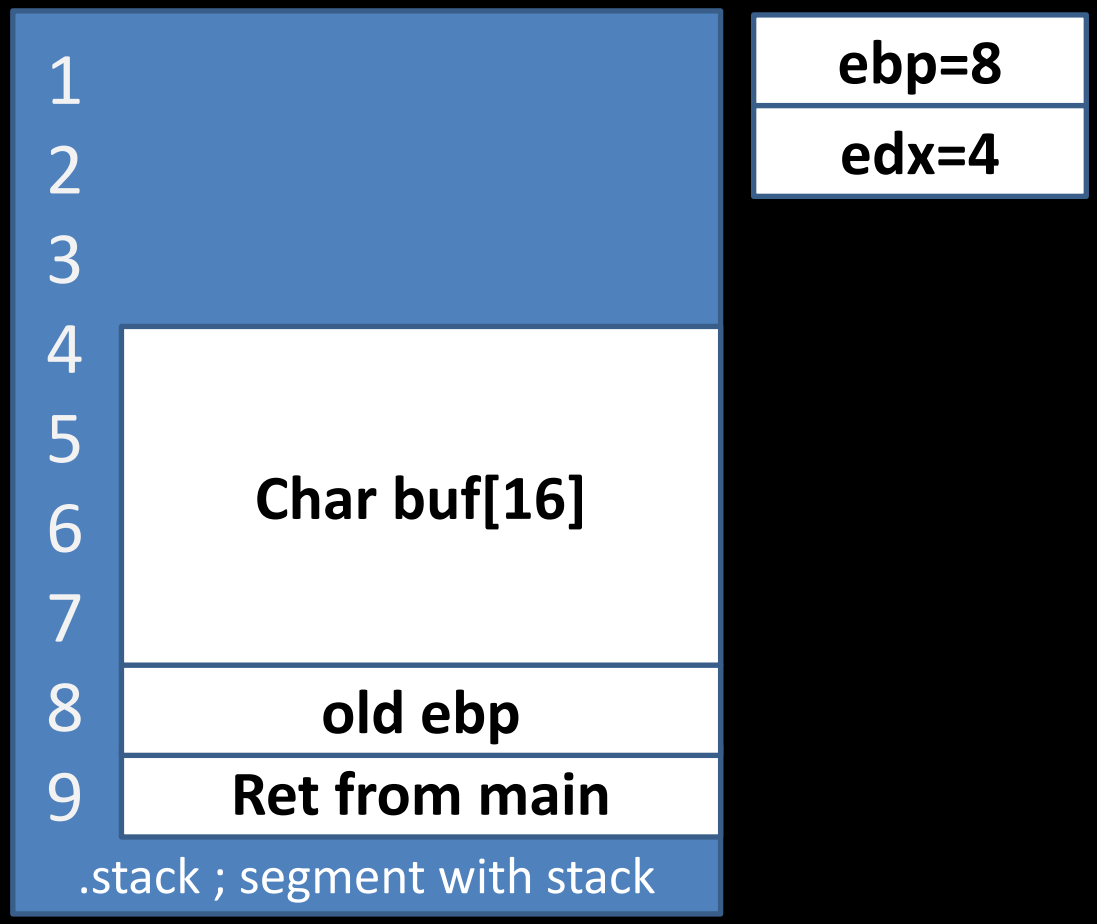

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ebp=8
edx=4

ret2libc

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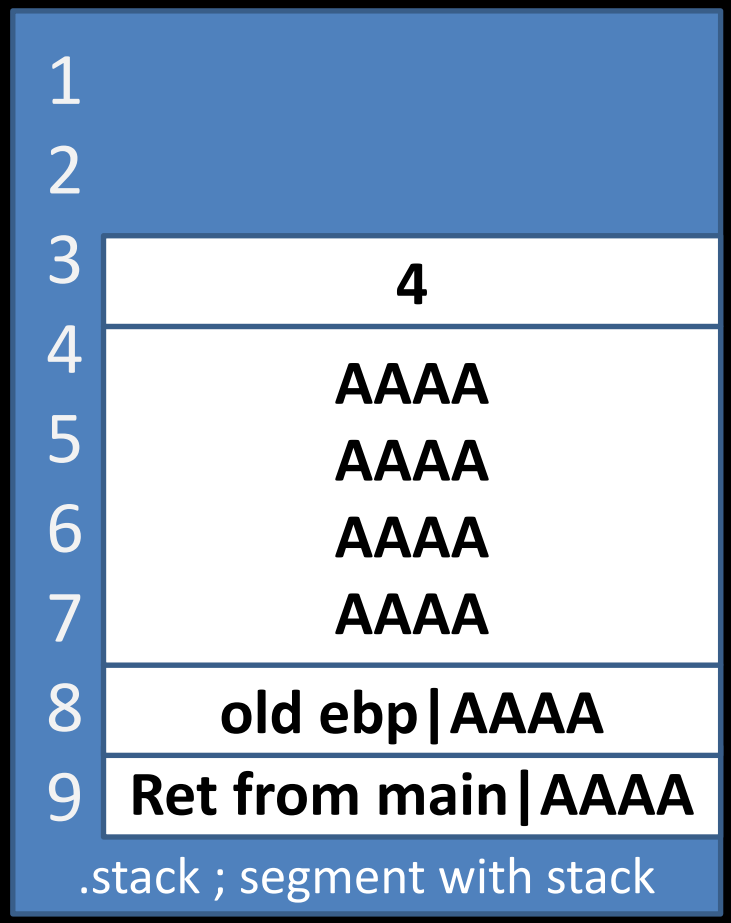

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eip

……

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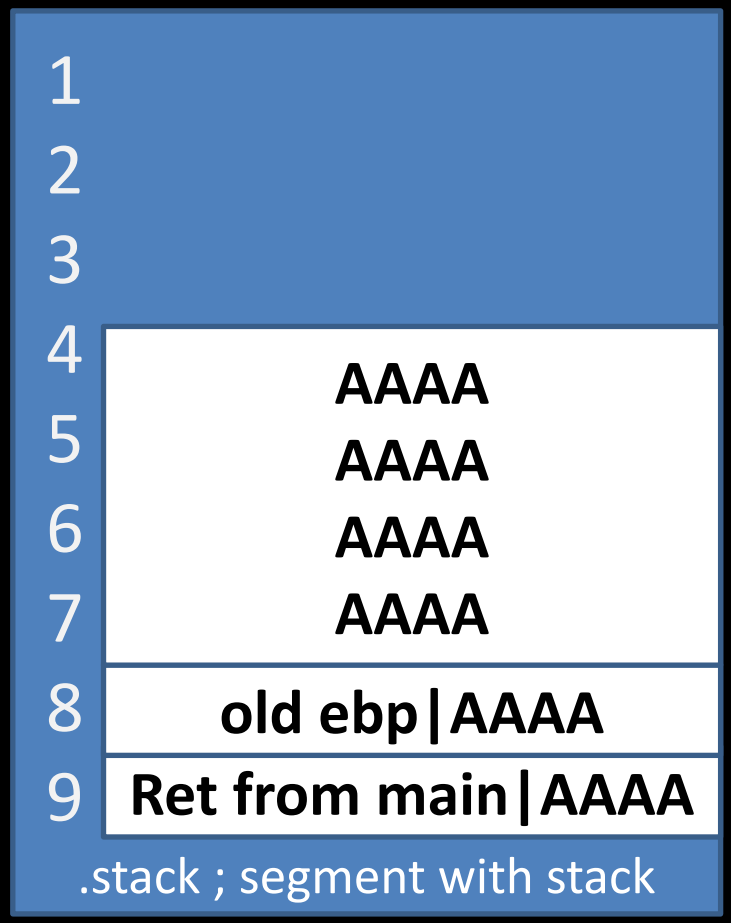

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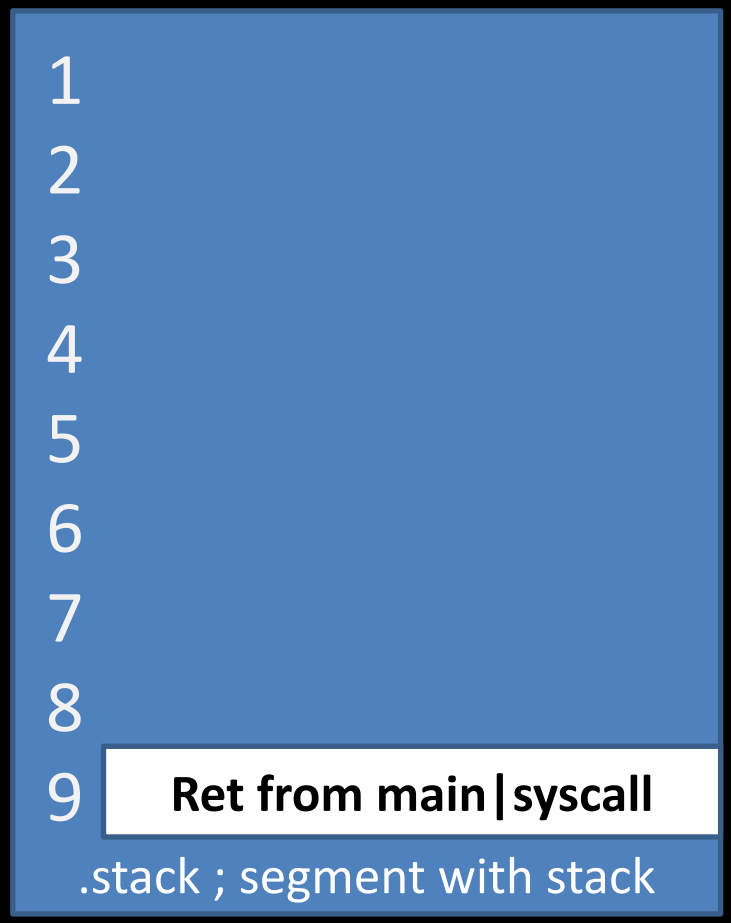

ebp=AAAA

edx=4

system =?

system =printf-CONST

system =libc.so:system

ret2libc

Main:

1. push ebp
2. mov ebp, esp
3. sub esp, 16
4. lea edx, buf
5. push edx
6. call gets
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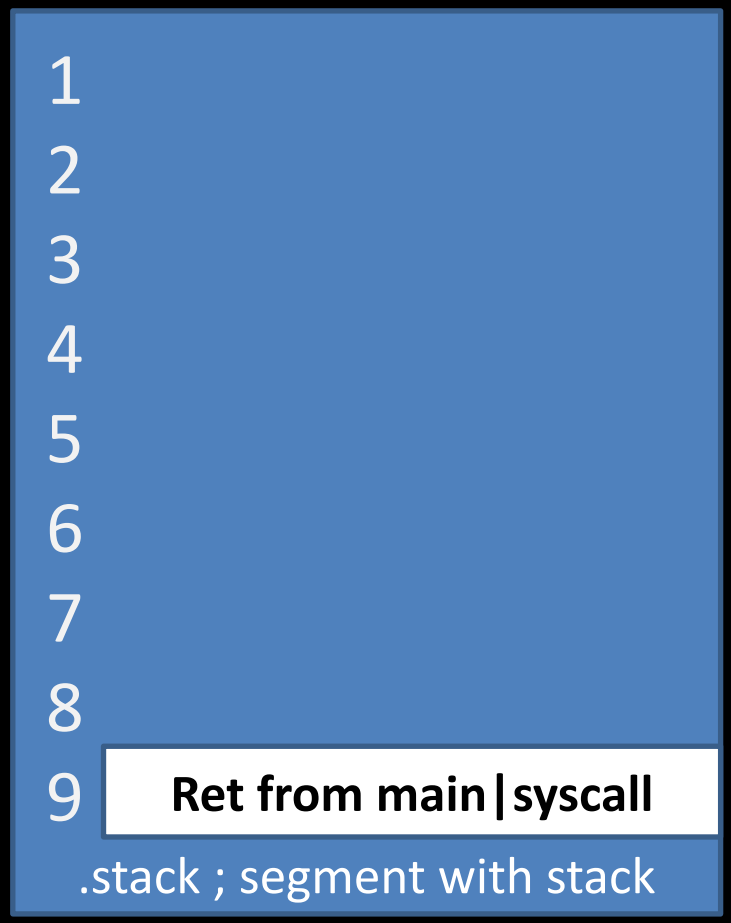

ebp=AAAA

edx=4

ret2libc

9. ret

……

…. eip

10. system :

11. …

12 ret

13. Printf:

14. …

15. ret

1

2

3

4

5

6

7

8

9

10

11

.stack ; segment with stack

ebp=AAAA
edx=4

ret2libc

9. ret

……

…. eip

10. system:

11. …

12 ret

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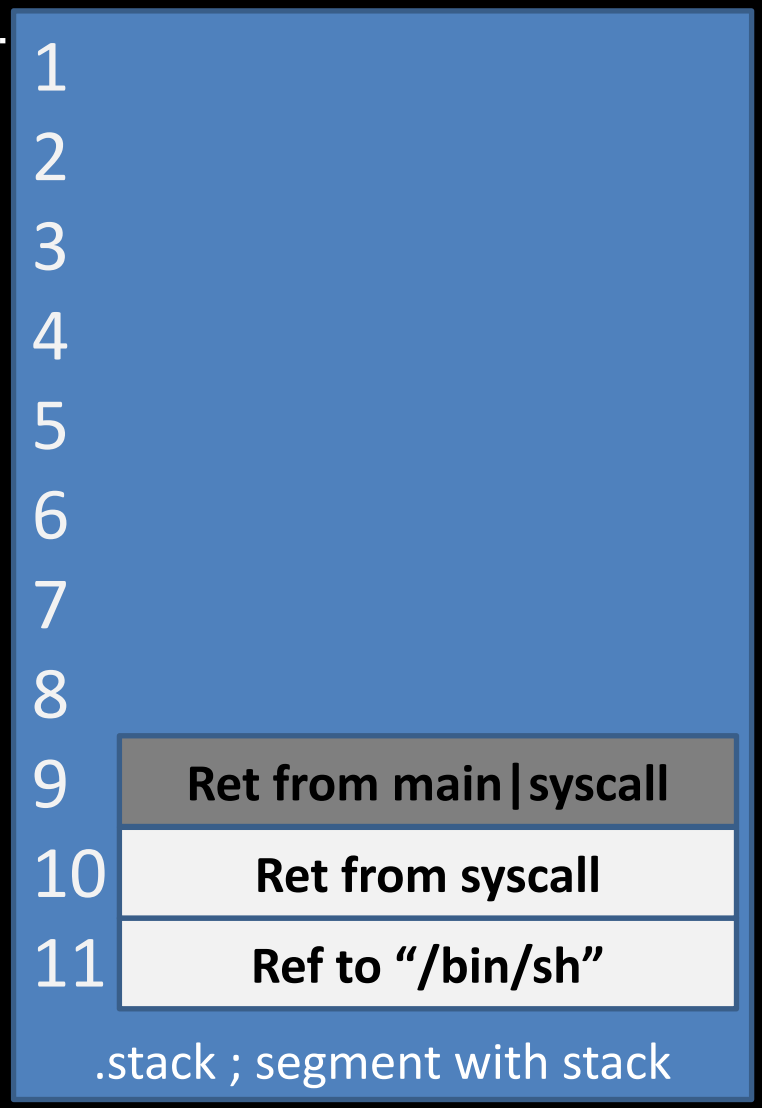
15. ret



ebp=AAAA
edx=4

Where is /bin/sh ?

Where is /bin/sh ?

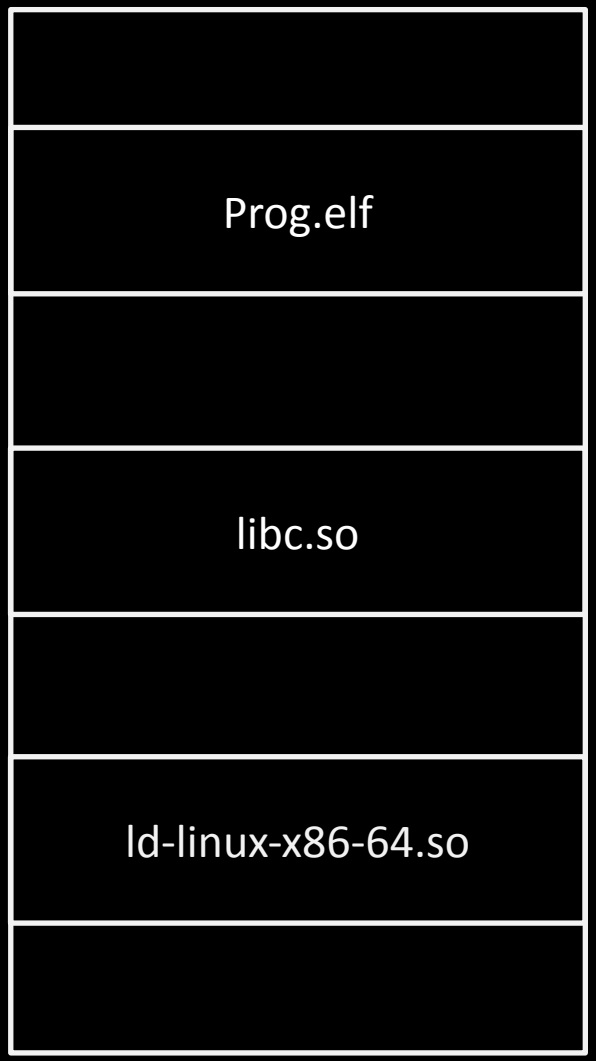
ropchain

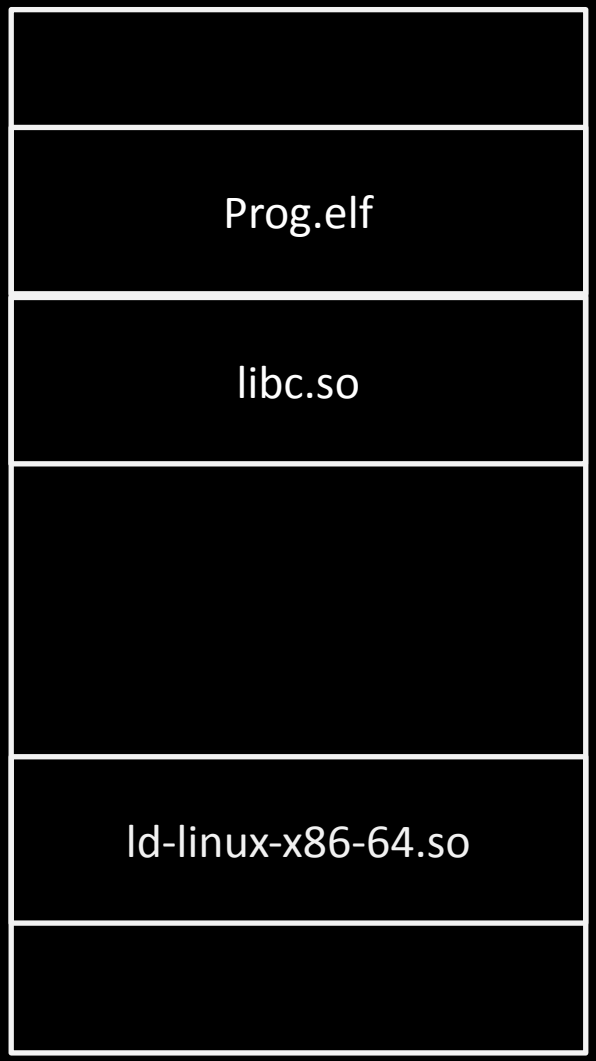
What about randomization

/proc/sys/kernel/randomize_va_space
0 – No randomization. Everything is static.
1 – Conservative randomization. Shared libraries, stack, mmap(), VDSO and heap are randomized.
2 – Full randomization. In addition to elements listed in the previous point, memory managed through brk() is also randomized.

Static compile

Static compile (-s)





Static compile (-s)

1. Works in any linux with any libc installed
2. ELF contains entire libraries
3. Very big binary
4. You can find many functions an gadgets - dangerous

GDB commands

gdb:
maint info sections – show sections
shell ps aux | grep test – show process pid
cat /proc/[PID]/maps – show sections of process
find [START ADDRESS], [END ADDRESS], “[STRING]”

shell:
ldd test

Now

```
#include <stdio.h>

int main(){
    char buf[16];
    gets(buf);
    puts(buf);
    return 0;
}
```

EXPLOIT this