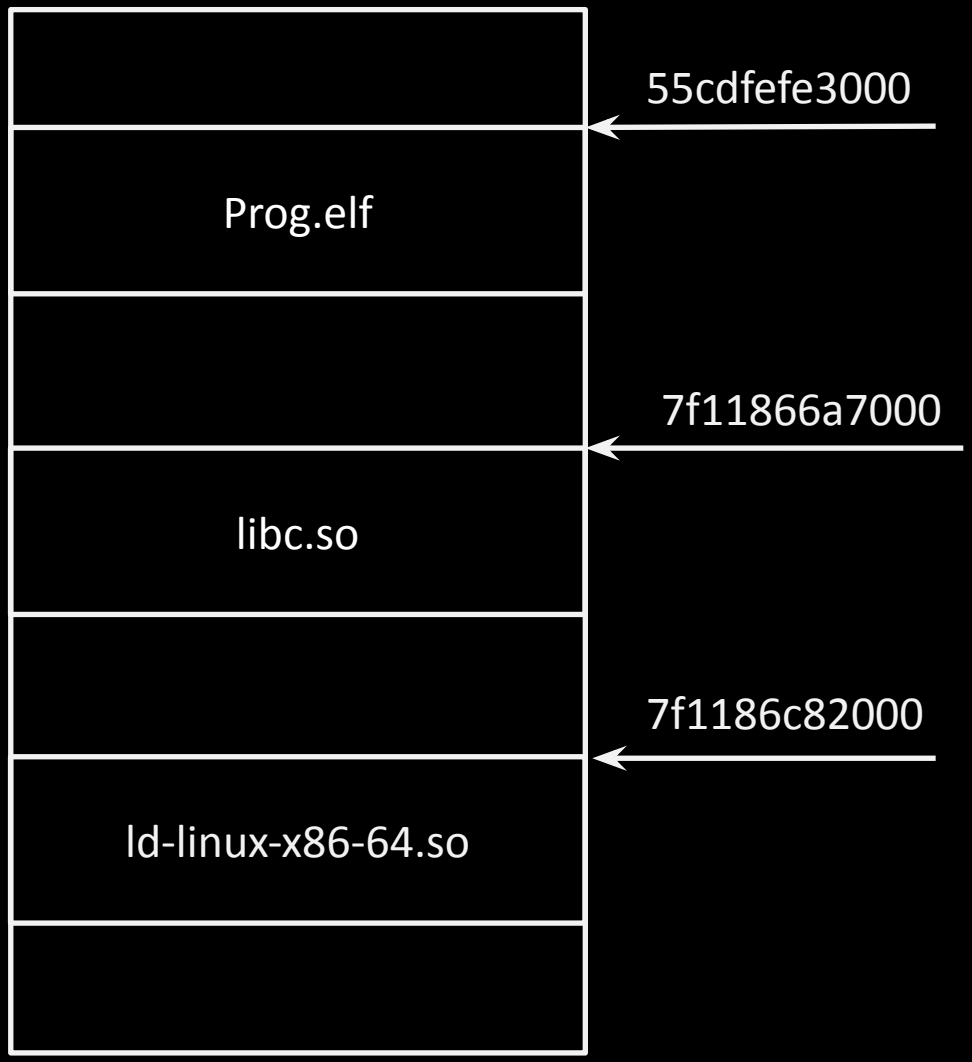
# Атака возврата в библиотеку
## return to libc attack

# What is libc ?


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

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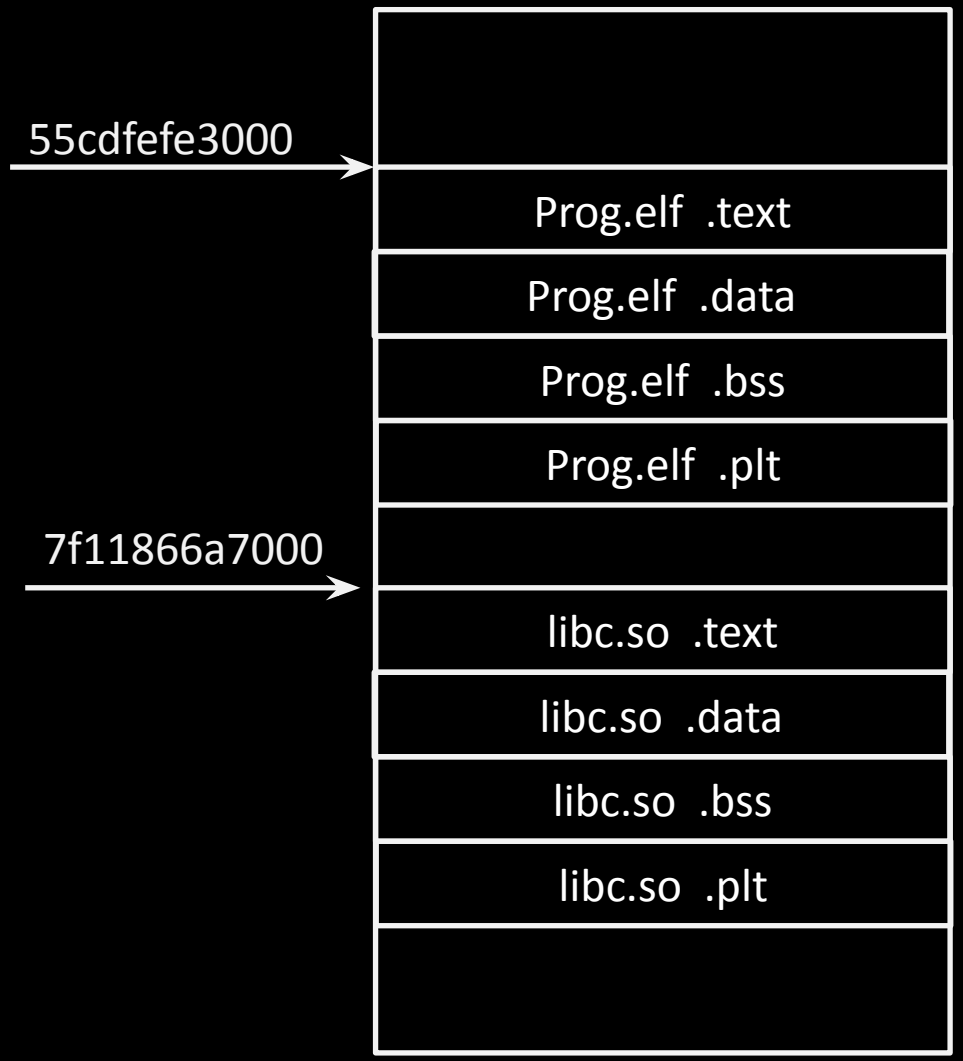
55cdfefe3000
Prog.elf .text
Prog.elf .data
Prog.elf .bss
Prog.elf .plt
7f11866a7000
libc.so .text
libc.so .data
libc.so .bss
libc.so .plt

# 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
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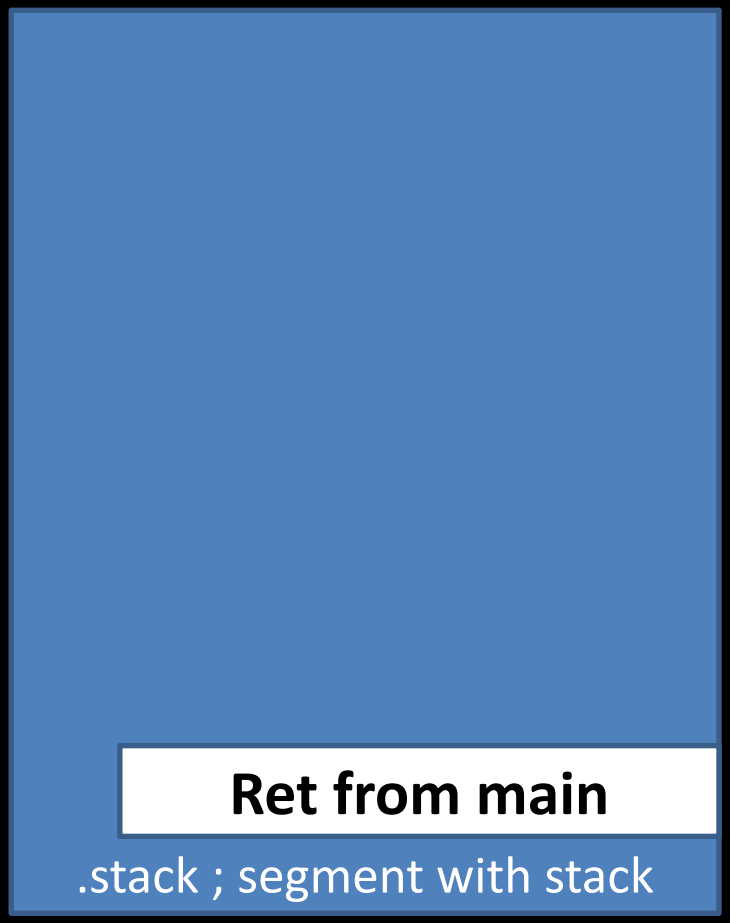

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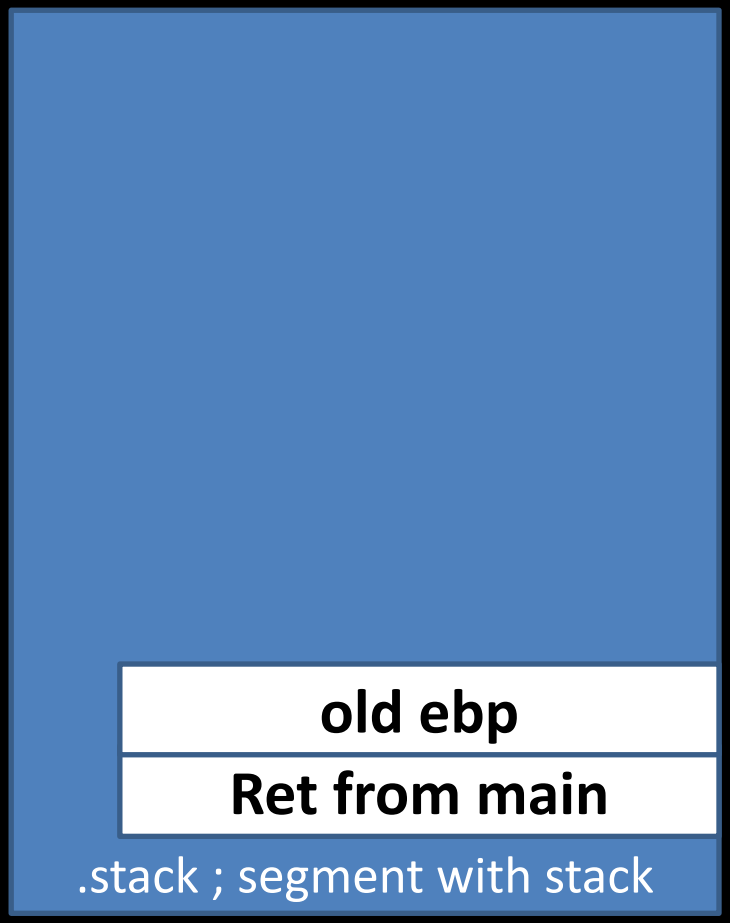

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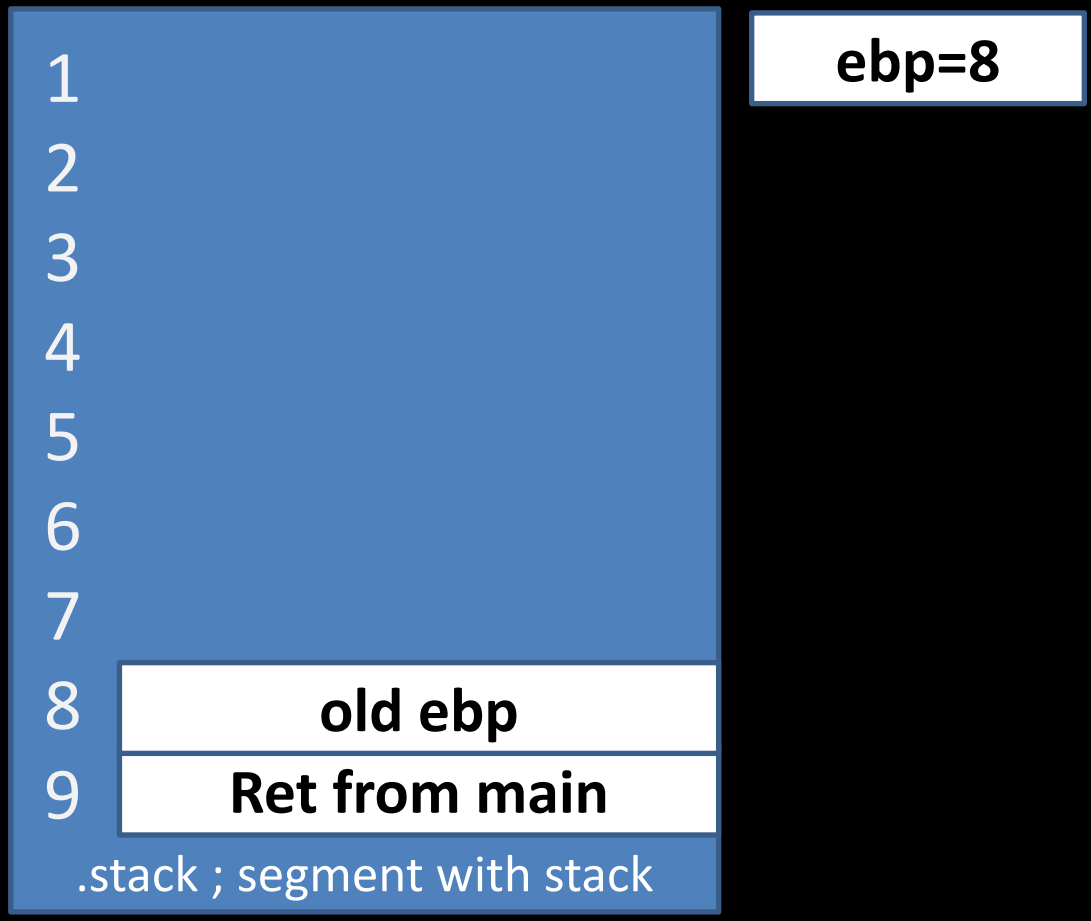

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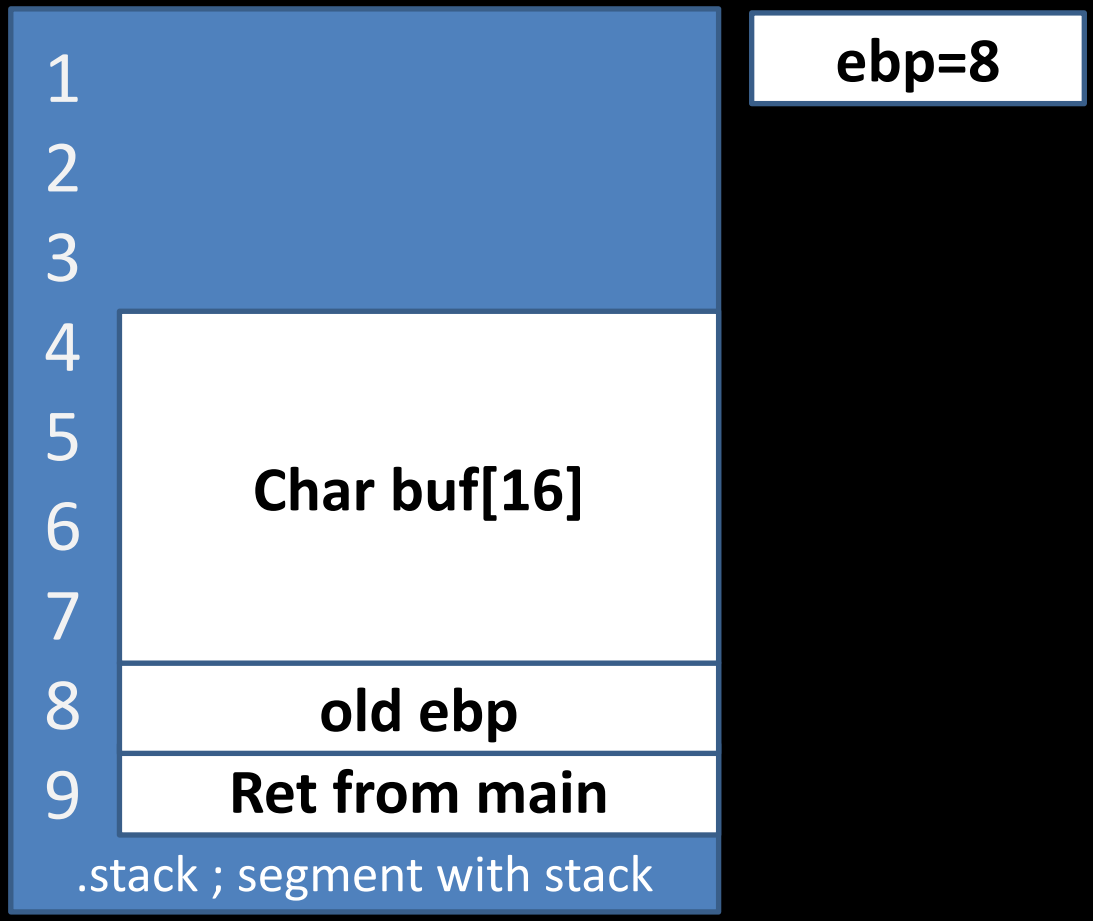

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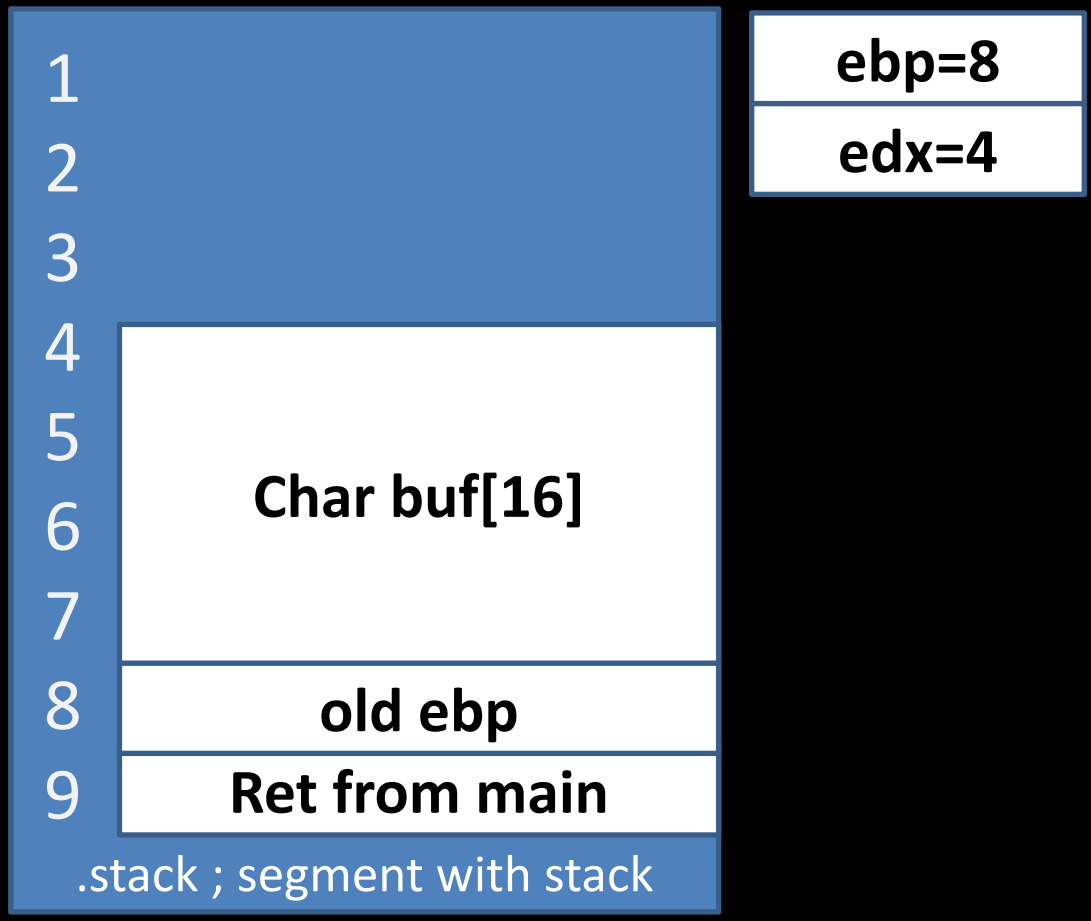

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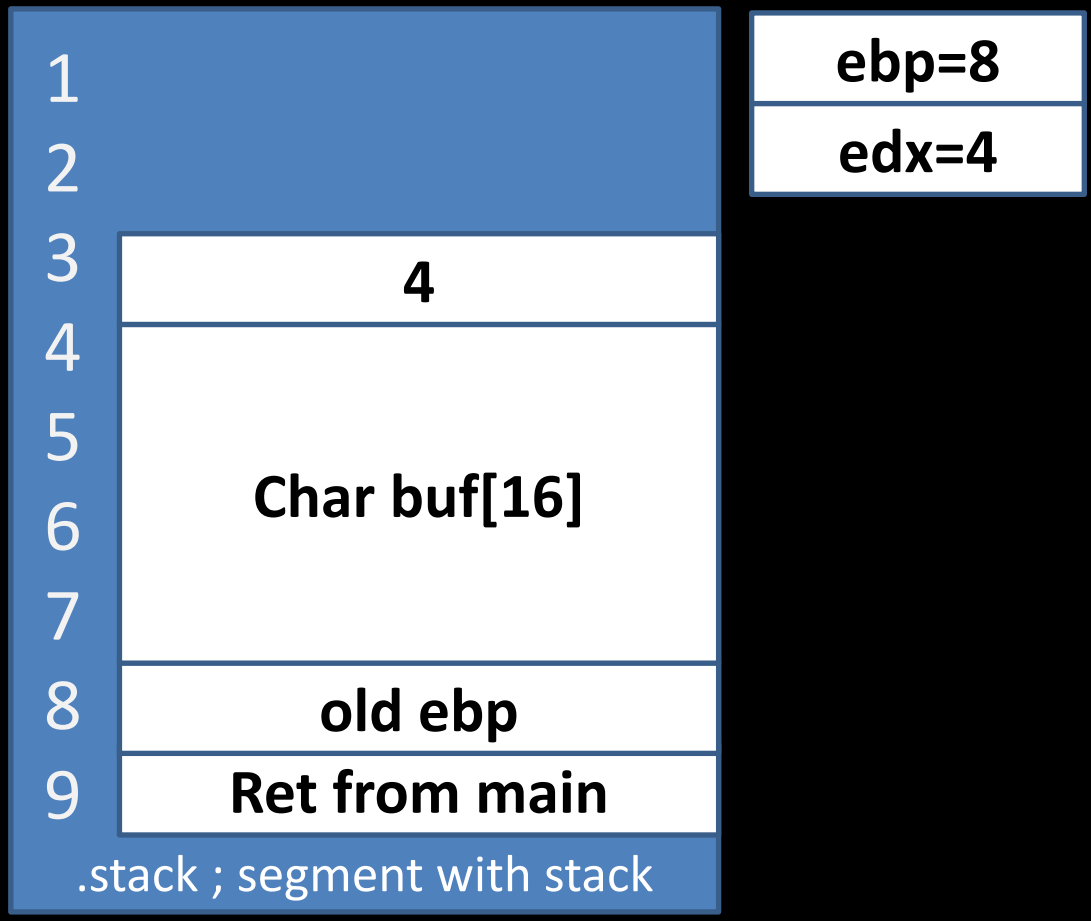

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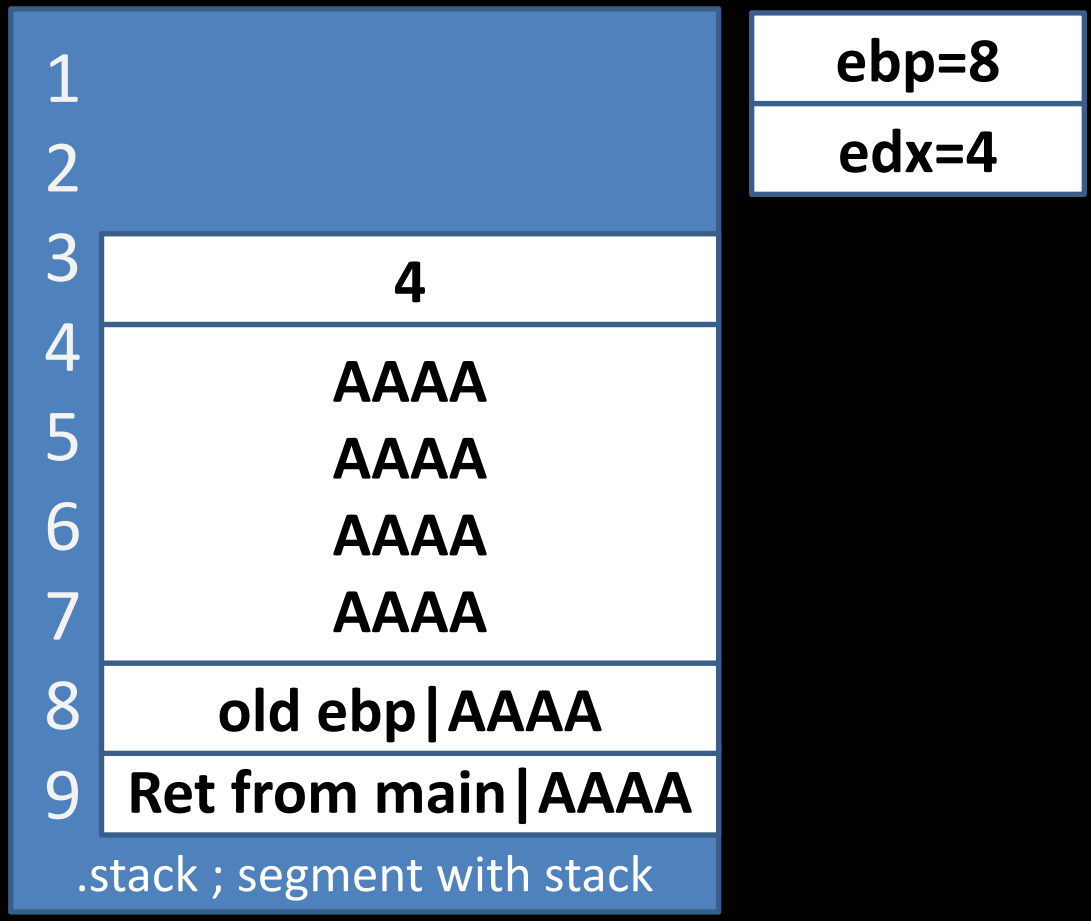

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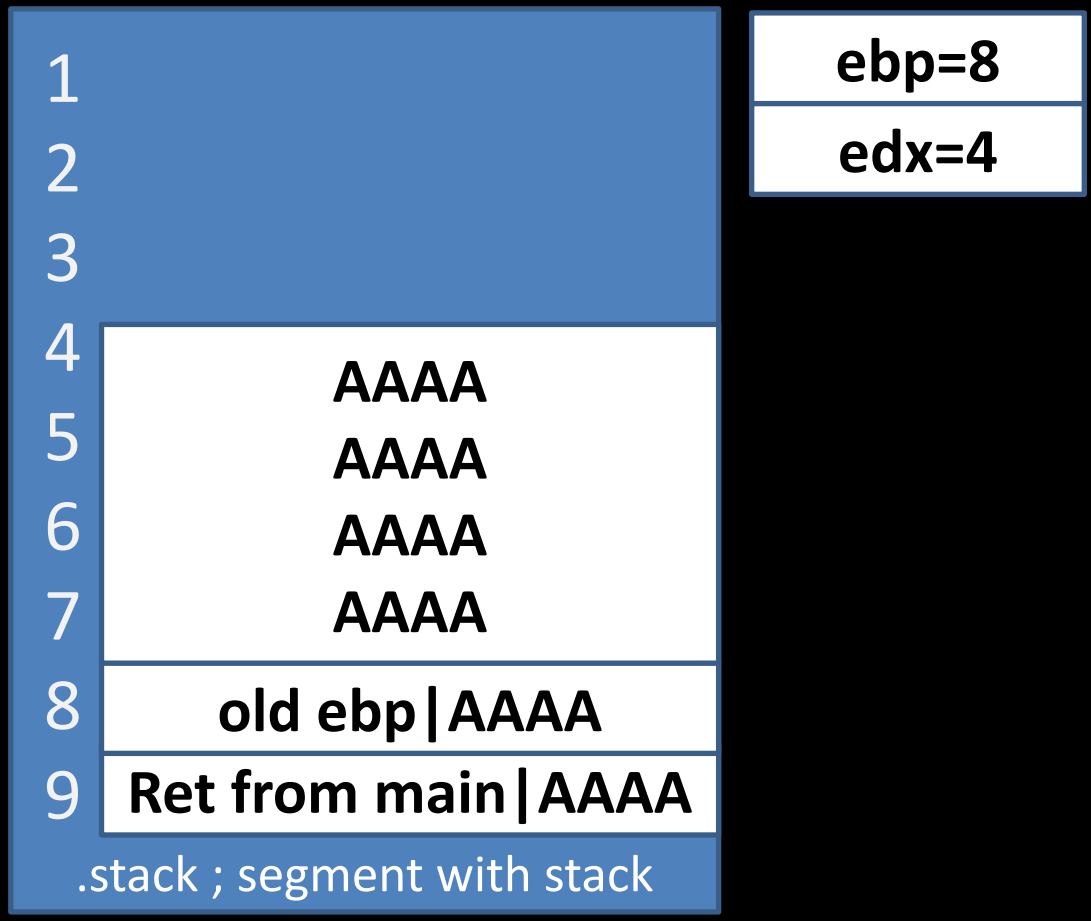

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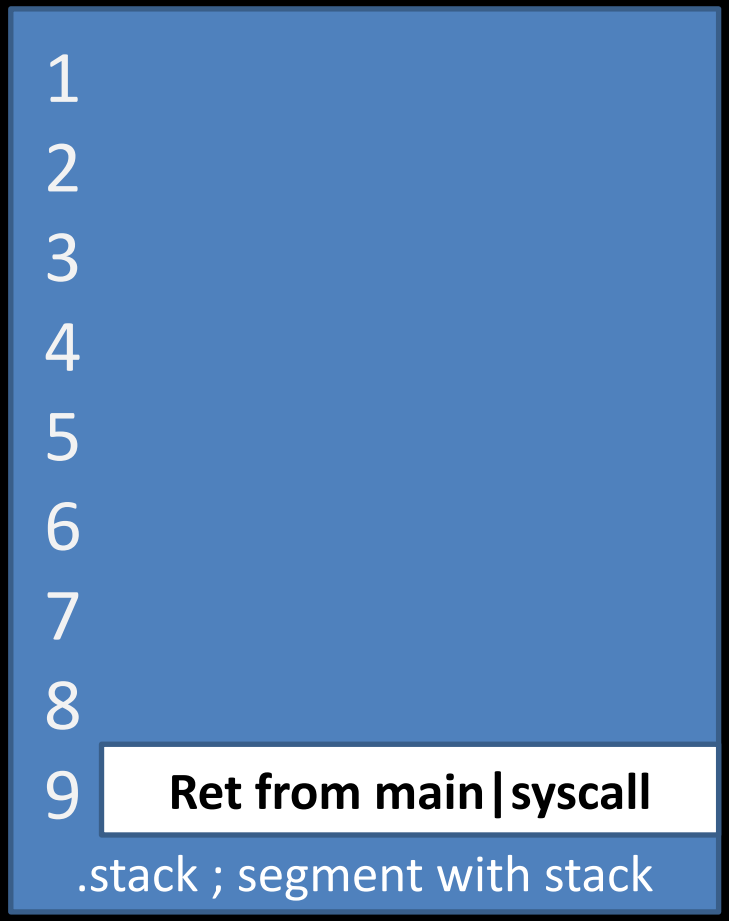


**ebp=AAAA**

**edx=4**

system =?

system =printf-CONST

system =libc.so:system

# ret2libc

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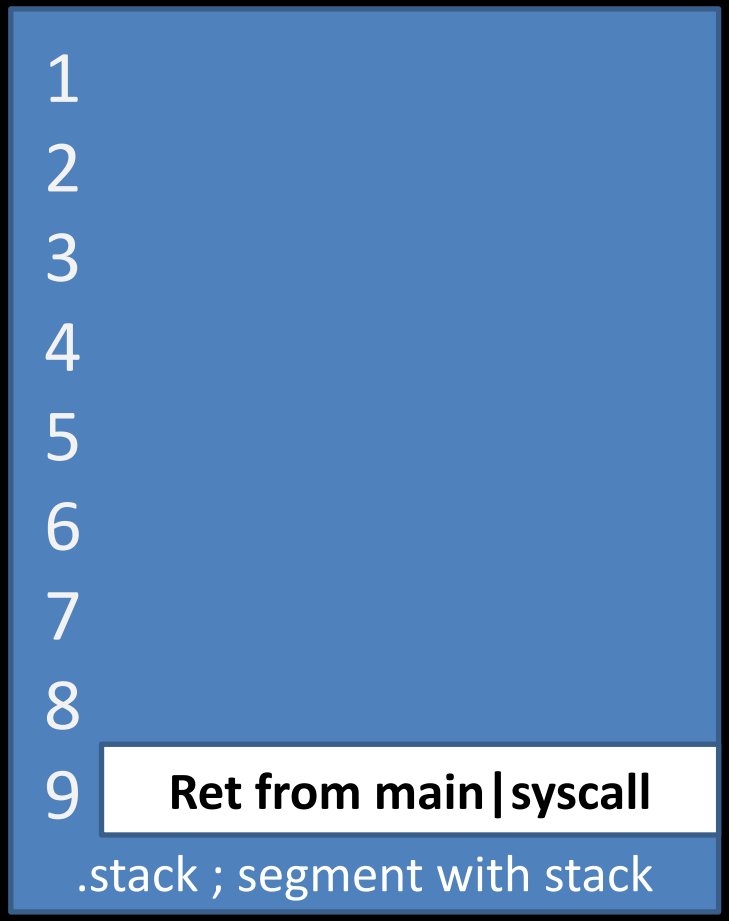


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# ret2libc

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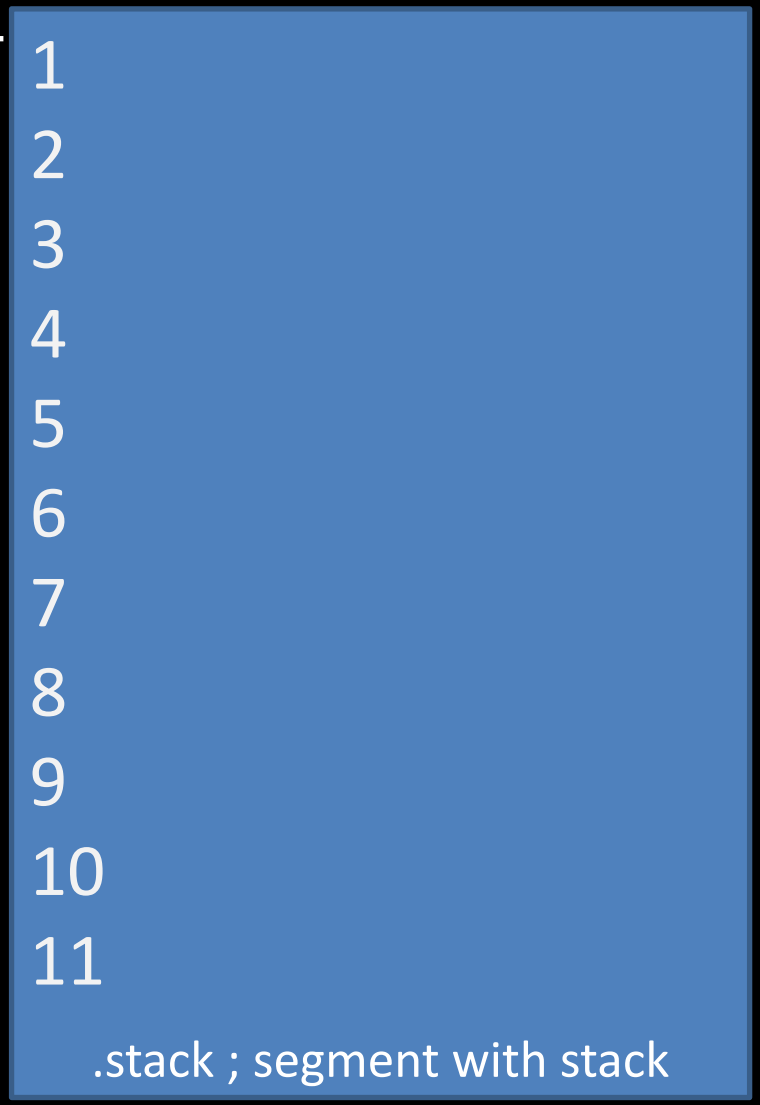


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# ret2libc

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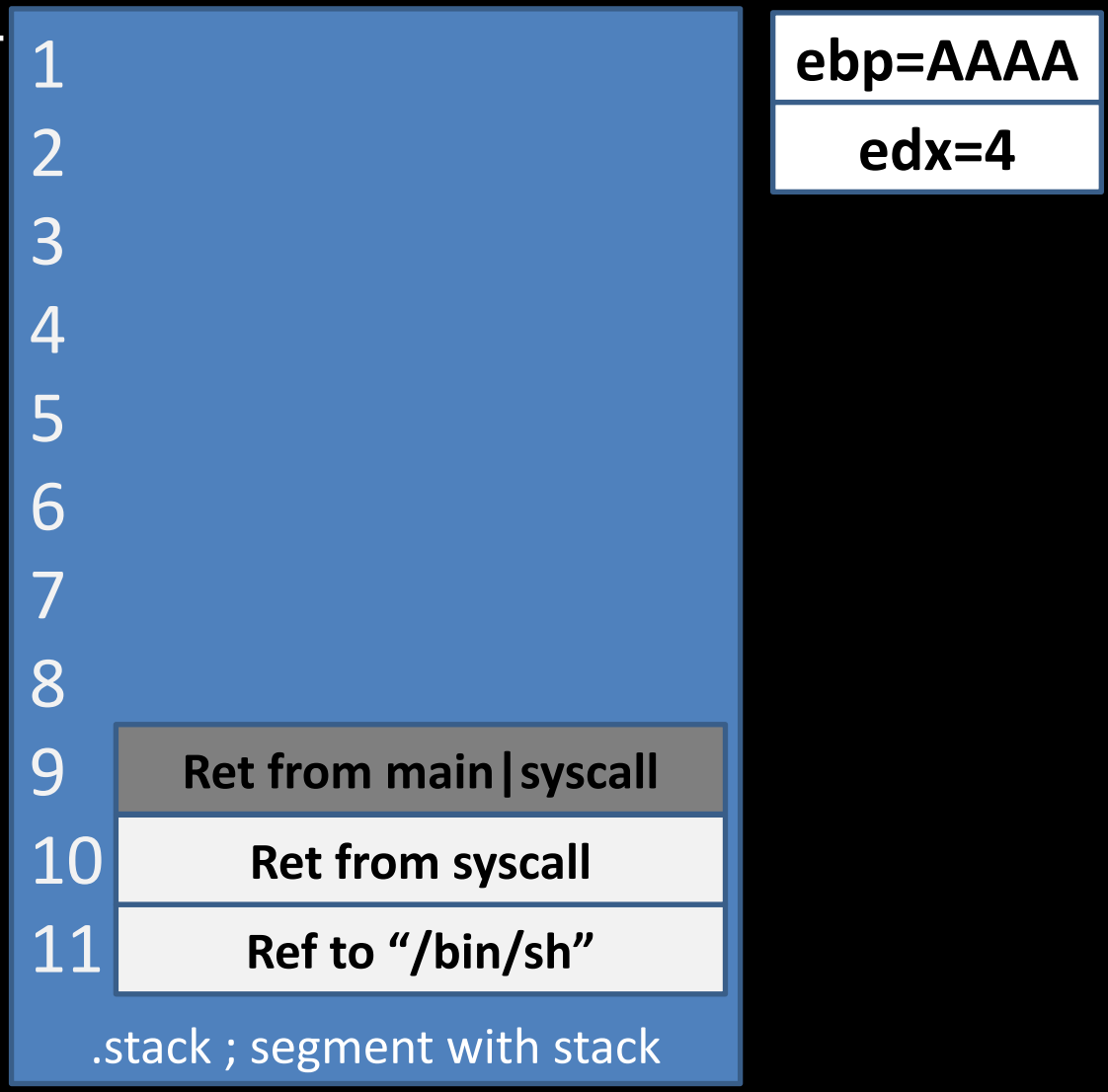

# Where is /bin/sh ?

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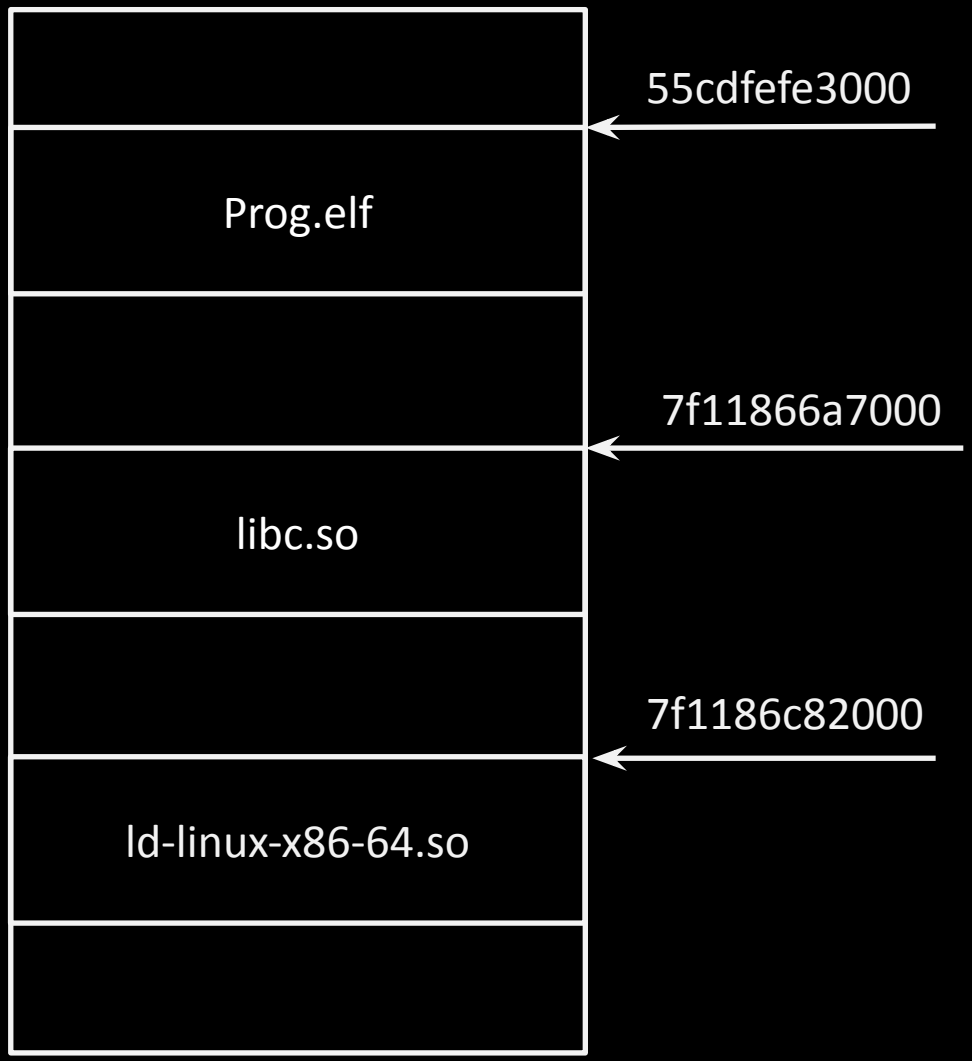
ropchain

# 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