Operating system experiment report

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Working target: Adding a system-call into a open source kernel and change it into Ubuntu system. After that, write a program to call the kernel.

Working environment: Window10 as basic operating system with "virtual box" virtual machine and Ubuntu18.04 running on it. The kernel I use is linux_5.02.

1. Write a system-call function into the sys.c file, which is in the folder /linux_5.02./kernel/

```
asmlinkage long sys_hello(void){
    printk("Hello Ubuntu");
    return 71117408;
}
```

2. Add a statement into the system-call registry syscall_64.tbl, which is in the folder/linux_5.02./arch/x86/entry/. In the kernel I use, the registry number is 548 since there already have 547 entry. Because I use a 64bit machine, so the registry is:

```
548  64  hello  sys_hello
```

3. Make a adjunction of system-call statement intosyscall.h, which is in the folder /linux_5.02./include/linux/

```
asmlinkage long sys_hello(void);
```

4. After that, I go into the root folder/linux_5.02 and begin **sudo make -j64**, I used 64 threads to make the compile faster.
5. After the compiling and new kernel installing, I got a new system which have a system-call interface I had just written. Then I wrote a system-call test program to test it.

```
#include<studio>
#include<sys/syscall.h>
#include<linux/kernel.h>
#include<unistd.h>
int main(){
    long use = syscall(548);
    printf("System call, ly：%ld\n",use);
    return 0;
}
```

The kernel successfully returned my school number: 71117408.


ly@ly-VirtualBox: ~
File Edit View Search Terminal Help
ly@ly-VirtualBox:~$ ./test
System call, ly:71117408
ly@ly-VirtualBox:~$