Download and compile the latest linux kernel

Target

1. Download the latest linux kernel
2. config the latest linux kernel
3. compile the latest linux kernel
4. boot ubuntu with the latest linux kernel

preparations

install related software package

```
sudo apt-get update
sudo apt-get upgrade
```

```
sudo apt-get install build-essential
```

```
sudo apt-get install wget
```

```
sudo apt-get install pkg-config
sudo apt-get install libgtk2.0-dev
sudo apt-get install libcanberra-gtk-module
sudo apt-get install glade
sudo apt-get install libglade2-dev
```

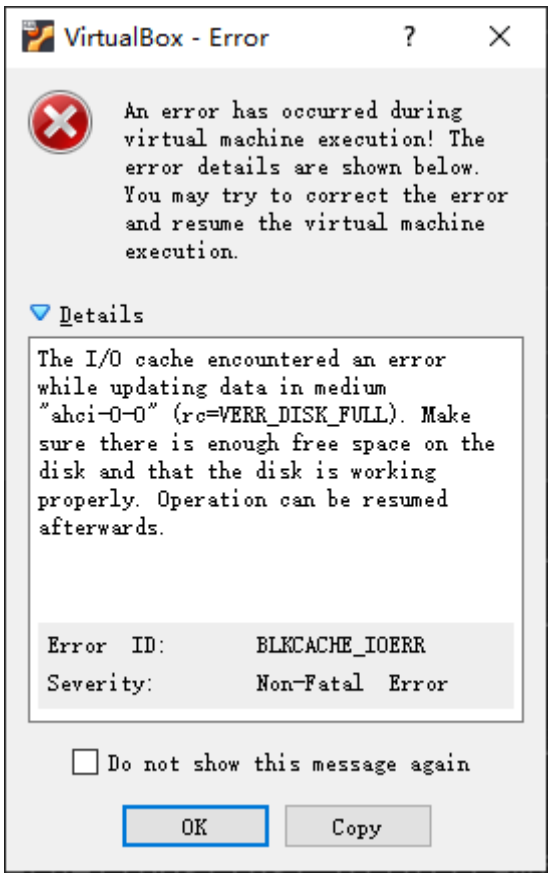
```
sudo apt-get install flex bison
sudo apt-get install libssl-dev
sudo apt-get install libelf-dev
sudo apt-get install libncurses-dev
```

view the current linux kernel version

```
$ uname -r
6.2.0-34-generic
$
```

check the unused disk and ensure sufficient disk free space of "/"

```
$ df -BG
文件系统        1G的块  已用  可用 已用% 挂载点
tmpfs              1G    1G    1G    1% /run
/dev/sda3         59G   29G   28G   52% /
tmpfs              4G    0G    4G    0% /dev/shm
tmpfs              1G    1G    1G    1% /run/lock
tmpfs              4G    0G    4G    0% /run/qemu
/dev/sda2          1G    1G    1G    2% /boot/efi
tmpfs              1G    1G    1G    1% /run/user/1000
$
```



很有可能没有磁盘空间啊：建议预留30GB空闲空间

How to do

Download and compile the latest linux kernel

the latest linux kernel

Linux Stable Kernel: 5.6.7 (2023.10.11)

1. Download the latest linux kernel from www.kernel.org

- linux kernel 6.5.7

```
cd ~
pwd
```

```
wget -c https://cdn.kernel.org/pub/linux/kernel/v6.x/linux-6.5.7.tar.xz
```

```
tar xvJf linux-6.5.7.tar.xz
```

```
sudo ln -s `pwd`/linux-6.5.7 /usr/src/linux
```

2. config the latest linux kernel

```
cd /usr/src/linux
cp /boot/config-`uname -r`    .config
```

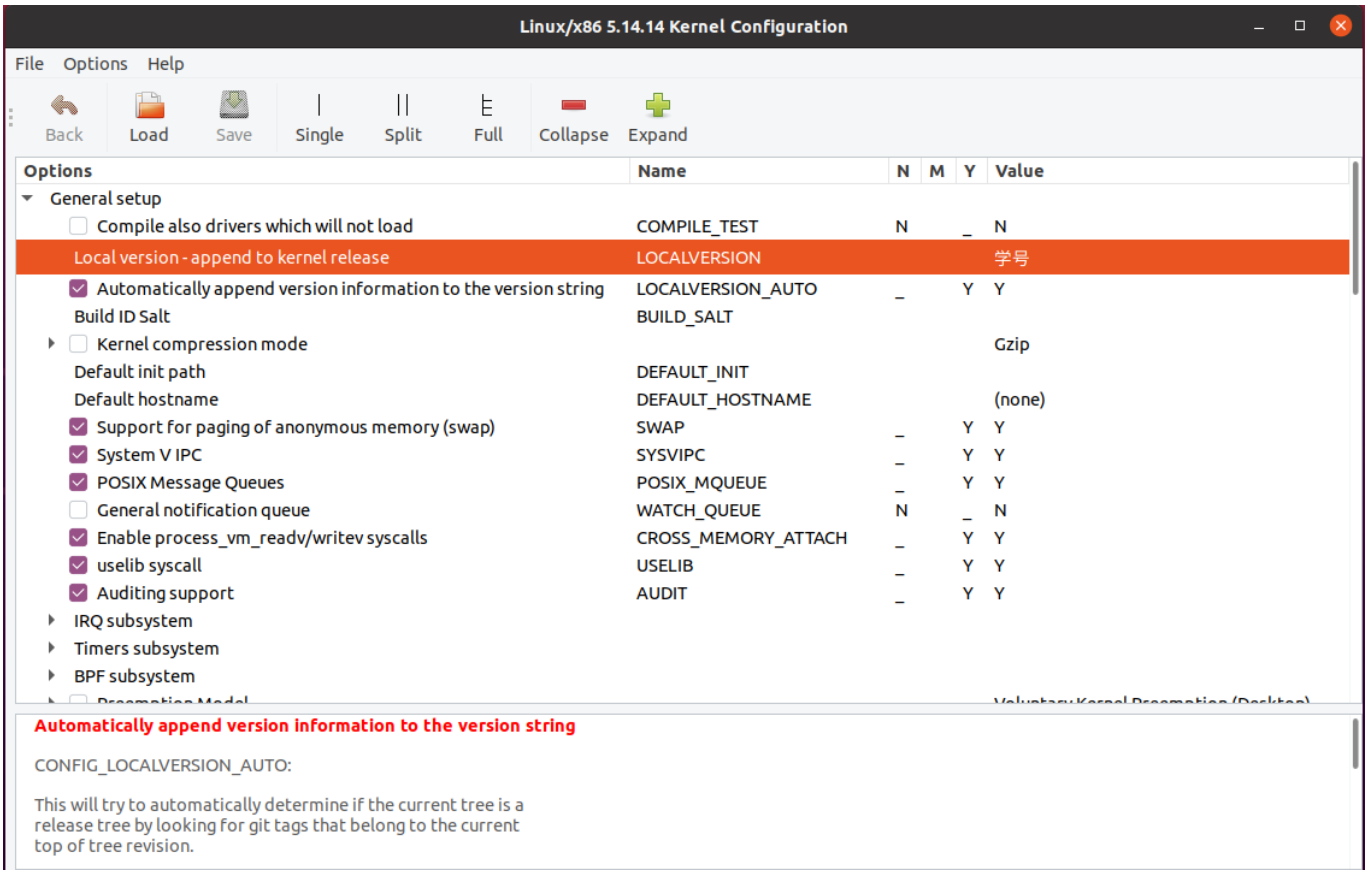
```
make oldconfig
此步骤需要一定的时间进行选择，一般选择N或n即可。

or: some wrong for the next command in linux-6.5.7
yes " " | make oldconfig
```

```
make gconfig
```

3. customized config

3.1. add local version

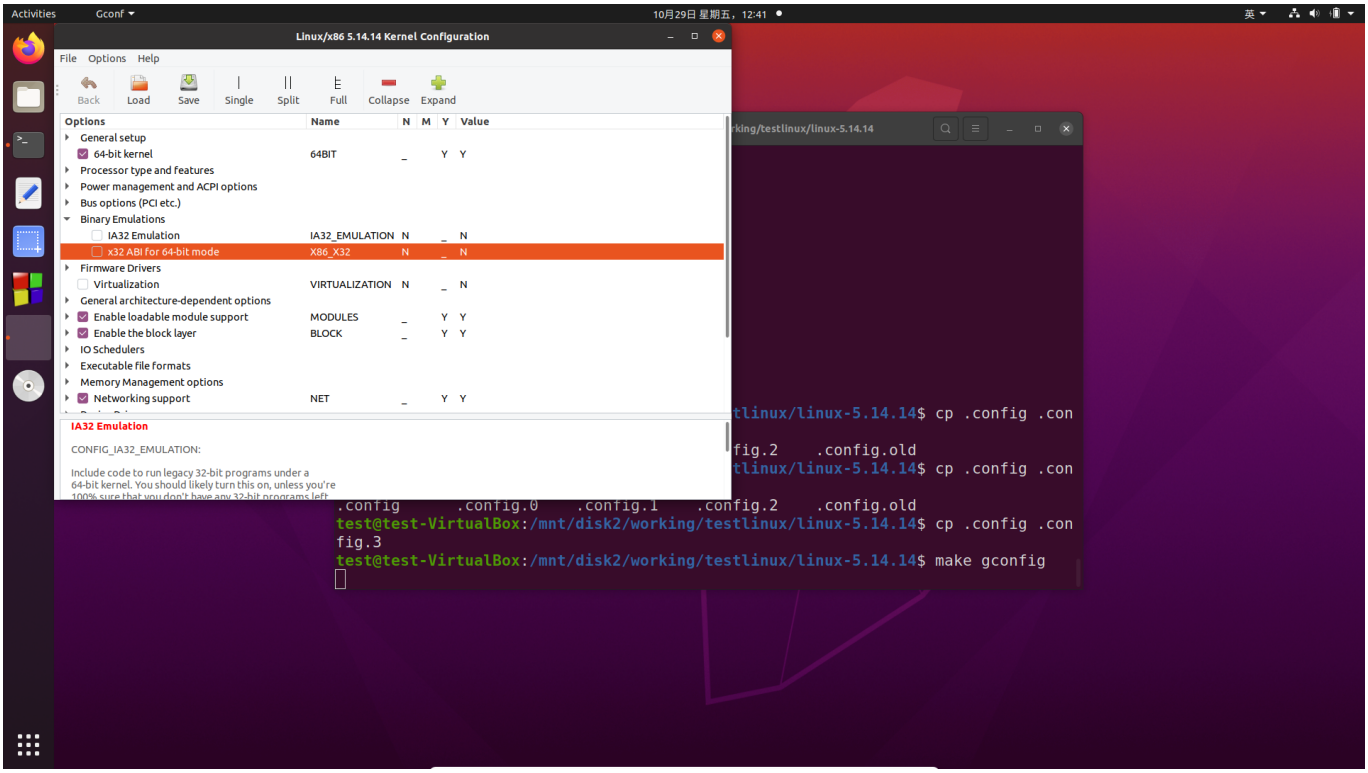
add your ID as local version 务必在新内核中嵌入你的学号！！！



3.2. some errors

3.2.1 arch/x86/Makefile:148: CONFIG_X86_X32 enabled but no binutils support

solution:disable the Binary Emulations



3.2.2 No rule to make target 'debian/canonical-certs.pem', needed by 'certs/x509_certificate_list

solution: set CONFIG_SYSTEM_TRUSTED_KEYS=""

in crytoXXX item of config

```
# Certificates for signature checking
#
CONFIG_MODULE_SIG_KEY="certs/signing_key.pem"
CONFIG_MODULE_SIG_KEY_TYPE_RSA=y
# CONFIG_MODULE_SIG_KEY_TYPE_ECDSA is not set
CONFIG_SYSTEM_TRUSTED_KEYRING=y

#CONFIG_SYSTEM_TRUSTED_KEYS="debian/canonical-certs.pem"
CONFIG_SYSTEM_TRUSTED_KEYS=""

CONFIG_SYSTEM_EXTRA_CERTIFICATE=y
CONFIG_SYSTEM_EXTRA_CERTIFICATE_SIZE=4096
CONFIG_SECONDARY_TRUSTED_KEYRING=y
CONFIG_SYSTEM_BLACKLIST_KEYRING=y
CONFIG_SYSTEM_BLACKLIST_HASH_LIST=""
CONFIG_SYSTEM_REVOCATION_LIST=y

#CONFIG_SYSTEM_REVOCATION_KEYS="debian/canonical-revoked-certs.pem"
CONFIG_SYSTEM_REVOCATION_KEYS=""
# CONFIG_SYSTEM_BLACKLIST_AUTH_UPDATE is not set
# end of Certificates for signature checking
```

(optional)4. clean the previous compilings

If you want to recompile , please execute the following command to clean the previous work:

```
make clean
```

5. compile the latest linux kernel (long wait)

compile the latest linux kernel

```
make -j4
```

此步骤需要执行很长时间，也有可能会出错。为了确认确实正常编译成功了，可再执行一遍make，这次会很快完成。

```
$ make
  CALL    scripts/checksyscalls.sh
  DESCEND objtool
  INSTALL libsubcmd_headers
  CHK     kernel/kheaders_data.tar.xz
```

```
Kernel: arch/x86/boot/bzImage is ready  (#3)
$
```

install the latest linux kernel

```
sudo make modules_install
sudo make install
```

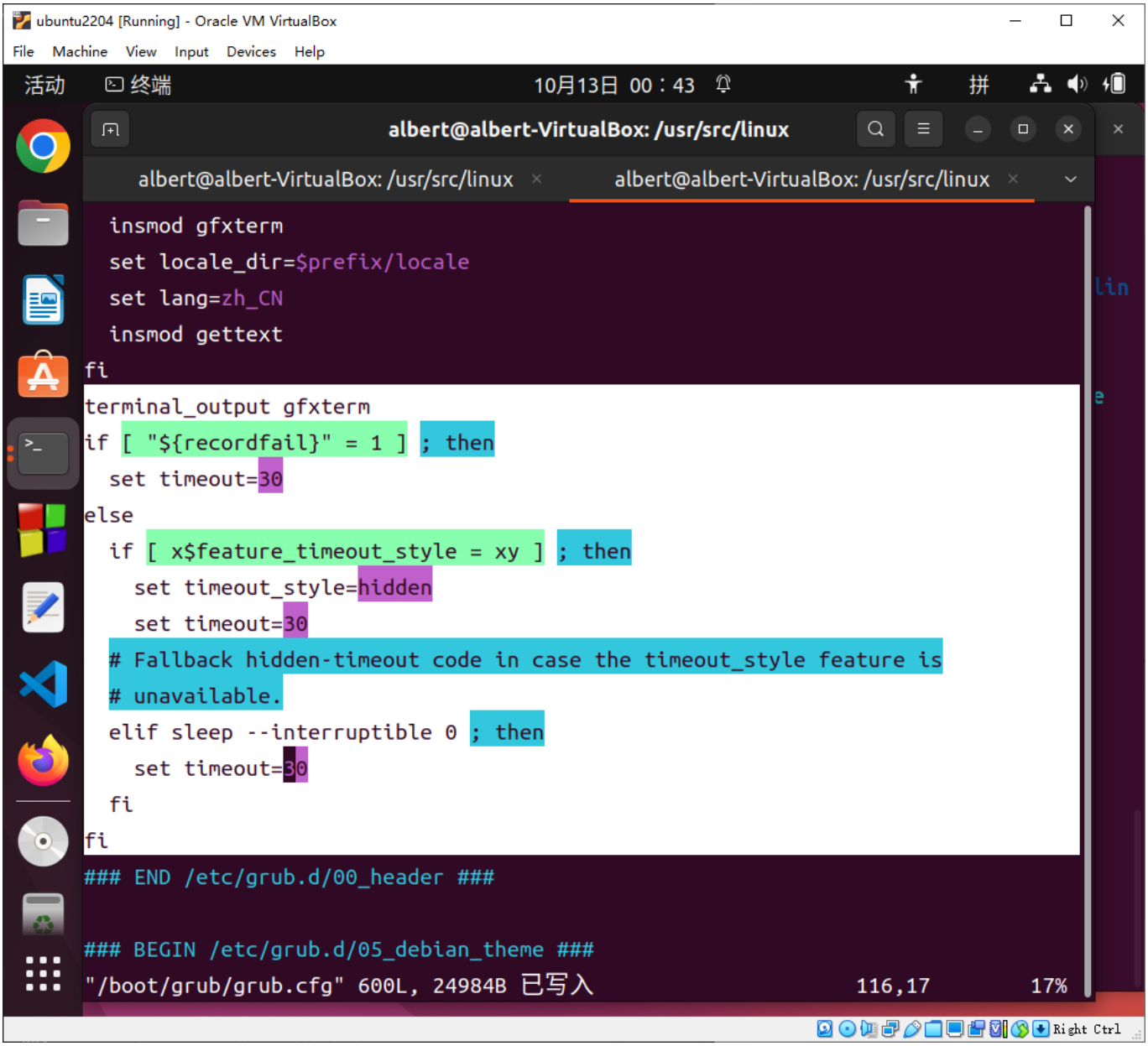
Successfully compiled:

```
/usr/src/linux$  sudo make install
  INSTALL /boot
run-parts: executing /etc/kernel/postinst.d/initramfs-tools 6.5.7AL20231012
/boot/vmlinuz-6.5.7AL20231012
update-initramfs: Generating /boot/initrd.img-6.5.7AL20231012
run-parts: executing /etc/kernel/postinst.d/unattended-upgrades 6.5.7AL20231012
/boot/vmlinuz-6.5.7AL20231012
run-parts: executing /etc/kernel/postinst.d/update-notifier 6.5.7AL20231012
/boot/vmlinuz-6.5.7AL20231012
run-parts: executing /etc/kernel/postinst.d/vboxadd 6.5.7AL20231012 /boot/vmlinuz-
6.5.7AL20231012
run-parts: executing /etc/kernel/postinst.d/xx-update-initrd-links 6.5.7AL20231012
/boot/vmlinuz-6.5.7AL20231012
I: /boot/initrd.img is now a symlink to initrd.img-6.5.7AL20231012
run-parts: executing /etc/kernel/postinst.d/zz-shim 6.5.7AL20231012 /boot/vmlinuz-
6.5.7AL20231012
run-parts: executing /etc/kernel/postinst.d/zz-update-grub 6.5.7AL20231012
/boot/vmlinuz-6.5.7AL20231012
Sourcing file `/etc/default/grub'
Sourcing file `/etc/default/grub.d/init-select.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-6.5.7AL20231012
Found initrd image: /boot/initrd.img-6.5.7AL20231012
Found linux image: /boot/vmlinuz-6.2.0-34-generic
Found initrd image: /boot/initrd.img-6.2.0-34-generic
Found memtest86+ image: /boot/memtest86+.elf
Found memtest86+ image: /boot/memtest86+.bin
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
done
/usr/src/linux$
```

6.(optional) modify the grub.cfg

```
sudo vi /boot/grub/grub.cfg
```

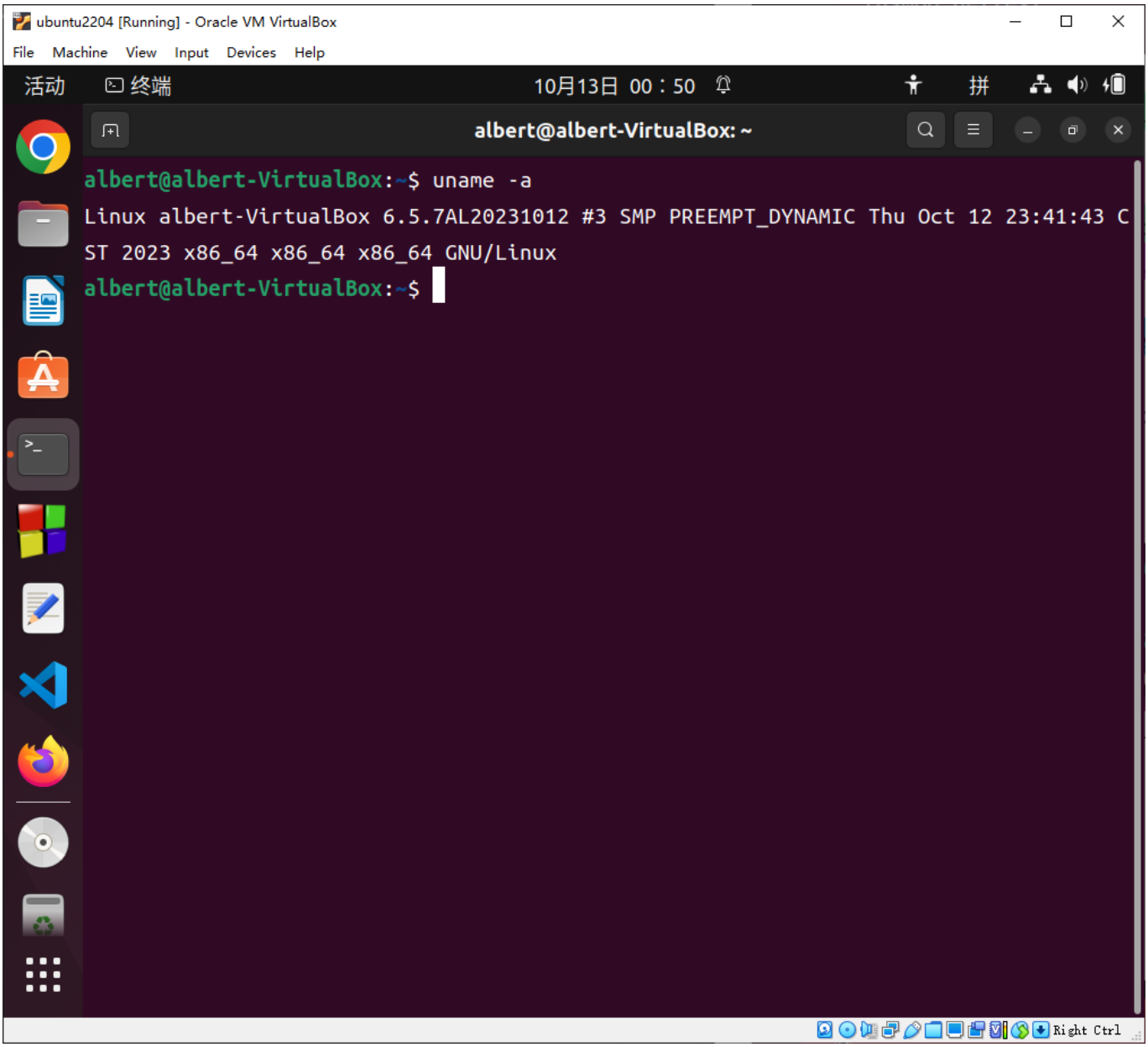
set timeout=30



7. boot ubuntu with the latest linux kernel

```
sudo reboot
```

```
uname -a
```


ubuntu2204 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
活动
终端
10月13日 00：50
拼
albert@albert-VirtualBox: ~
albert@albert-VirtualBox:~$ uname -a
Linux albert-VirtualBox 6.5.7AL20231012 #3 SMP PREEMPT_DYNAMIC Thu Oct 12 23:41:43 C
ST 2023 x86_64 x86_64 x86_64 GNU/Linux
albert@albert-VirtualBox:~$
Right Ctrl

End.