

# OS-HW1-PART1

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## How to compile Linux kernel

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### Reference

- <https://www.cyberciti.biz/tips/compiling-linux-kernel-26.html>

### Download kernel

- find the kernel version `uname -r`
- [linux kernel archives](#)
- [linux kernel archives](#)
- extract tar.xz file using `tar -xvf linux-***.tar.xz`
- cd to extracted linux-\*\*\* folder
- `cp -v /boot/config-$(uname -r) .config`
- open Makefile
- setting EXTRAVERSION = -M1130400477
- open .config
- setting CONFIG\_SYSTEM\_TRUSTED\_KEYS from "debian/canonical-certs.pem" to ""
- setting CONFIG\_SYSTEM\_REVOCATION\_KEYS from "debain/canonical-certs.pem" to ""

### Download compilers and other tools

- `sudo apt install build-essential libncurses-dev bison flex libssl-dev libelf-dev`

### compile

- `make -j $(nproc)`
- `sudo make modules_install`
- `sudo make install`
- `sudo update-initramfs -c -k {your kernel version} {kernel version}=5.19.11-M113040047`
- `sudo update-grub`
- `reboot`

### Result

```
os@os-VirtualBox: ~  
os@os-VirtualBox:~$ uname -a  
Linux os-VirtualBox 5.19.11-M113040047 #1 SMP PREEMPT_DYNAMIC Sun Mar 19 03:01:1  
1 CST 2023 x86_64 x86_64 x86_64 GNU/Linux  
os@os-VirtualBox:~$ ifconfig -a  
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::abda:36e6:fdcd:b91e prefixlen 64 scopeid 0x20<link>  
    ether 08:00:27:a5:fb:f7 txqueuelen 1000 (Ethernet)  
    RX packets 173 bytes 216671 (216.6 KB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 128 bytes 13091 (13.0 KB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0x10<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 206 bytes 16285 (16.2 KB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 206 bytes 16285 (16.2 KB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
os@os-VirtualBox:~$ ping 140.117.11.1 -c 5  
PING 140.117.11.1 (140.117.11.1) 56(84) bytes of data.  
64 bytes from 140.117.11.1: icmp_seq=1 ttl=250 time=1.34 ms  
64 bytes from 140.117.11.1: icmp_seq=2 ttl=250 time=1.07 ms  
64 bytes from 140.117.11.1: icmp_seq=3 ttl=250 time=1.90 ms  
64 bytes from 140.117.11.1: icmp_seq=4 ttl=250 time=2.99 ms  
64 bytes from 140.117.11.1: icmp_seq=5 ttl=250 time=2.49 ms  
  
--- 140.117.11.1 ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 4006ms  
rtt min/avg/max/mdev = 1.068/1.957/2.993/0.712 ms
```

For TA

```
# ssh to my ssh server  
# password: 0000  
ssh -p 2022 os@140.117.169.41
```