- 在ubuntu18.04中，执行make modules_install和安装内核make install时需要提供root权限，需使用sudo命令执行安装

- 如果是多核PC，在编译内核过程中，可以使用

    #make –jn

    命令来编译，提高编译速度，其中n是要衍生的作业数，例如双核可以配置为4。

- 重启后进入新内核时如果出现黑屏，登录无响应等情况，可能与虚拟机设置有关，可以通过关闭3D加速，启用PAE/NX，启用I/O APIC等设置来解决

- 重启后，如果某些硬件没有驱动起来，可以通过配置内核或寻找相应驱动来解决

内核编译相关bug及解决方法

1. 进行内核配置make menuconfig时，出现以下错误：

```
*** Unable to find the ncurses libraries or the
*** required header files.
*** 'make menuconfig' requires the ncurses libraries.
***
*** Install ncurses (ncurses-devel) and try again.
***
scripts/kconfig/Makefile:202: recipe for target 'scripts/kconfig/dochecklxdialog
' failed
make[1]: *** [scripts/kconfig/dochecklxdialog] Error 1
Makefile:505: recipe for target 'menuconfig' failed
make: *** [menuconfig] Error 2
```

解决方法：

这是由于缺少相关库所致，安装ncurses即可

安装命令：sudo apt-get install libncurses5-dev

安装时如果网速慢，建议修改软件源镜像，比如清华镜像。

内核编译相关bug及解决方法

2. 进行内核配置make menuconfig时，出现以下错误：

```
jin@ubuntu:~/linux-4.19.23$ make menuconfig
  HOSTCC   scripts/basic/fixdep
  UPD      scripts/kconfig/.mconf-cfg
  HOSTCC   scripts/kconfig/mconf.o
  YACC     scripts/kconfig/zconf.tab.c
/bin/sh: 1: bison: not found
scripts/Makefile.lib:196: recipe for target 'scripts/kconfig/zconf.tab.c' failed
make[1]: *** [scripts/kconfig/zconf.tab.c] Error 127
Makefile:539: recipe for target 'menuconfig' failed
make: *** [menuconfig] Error 2
```

解决方法：

这是由于缺少相关命令所致，安装bison即可

安装命令：sudo apt-get install bison

内核编译相关bug及解决方法

3. 进行内核配置make menuconfig时，出现以下错误：

```
jin@ubuntu:~/linux-4.19.23$ make menuconfig
  YACC    scripts/kconfig/zconf.tab.c
  LEX     scripts/kconfig/zconf.lex.c
/bin/sh: 1: flex: not found
scripts/Makefile.lib:188: recipe for target 'scripts/kconfig/zconf.lex.c' failed
make[1]: *** [scripts/kconfig/zconf.lex.c] Error 127
Makefile:539: recipe for target 'menuconfig' failed
make: *** [menuconfig] Error 2
```

解决方法：

这是由于缺少相关命令所致，安装flex即可

安装命令：sudo apt-get install flex

4. 进行内核编译make时，出现以下错误：


```
jin@ubuntu:~/linux-4.19.23$ make -j4
scripts/kconfig/conf  --syncconfig Kconfig
  SYSHDR   arch/x86/include/generated/asm/unistd_32_ia32.h
  SYSTBL   arch/x86/include/generated/asm/syscalls_32.h
  SYSHDR   arch/x86/include/generated/asm/unistd_64_x32.h
  SYSTBL   arch/x86/include/generated/asm/syscalls_64.h
  SYSHDR   arch/x86/include/generated/uapi/asm/unistd_32.h
  UPD      include/config/kernel.release
  SYSHDR   arch/x86/include/generated/uapi/asm/unistd_64.h
  WRAP     arch/x86/include/generated/uapi/asm/bpf_perf_event.h
  WRAP     arch/x86/include/generated/uapi/asm/poll.h
  SYSHDR   arch/x86/include/generated/uapi/asm/unistd_x32.h
  UPD      include/generated/uapi/linux/version.h
  UPD      include/generated/utsrelease.h
error: Cannot generate ORC metadata for CONFIG_UNWINDER_ORC=y, please install li
belf-dev, libelf-devel or elfutils-libelf-devel
Makefile:1115: recipe for target 'prepare-objtool' failed
make: *** [prepare-objtool] Error 1
make: *** Waiting for unfinished jobs....
make: *** wait: No child processes.  Stop.
```

解决方法：
这是由于缺少相关库所致，安装libelf-dev即可
安装命令：sudo apt-get install libelf-dev

5. 进行内核编译make时，出现以下错误：


```
    CHK     include/generated/utsrelease.h
    UPD     include/generated/utsrelease.h
    HOSTCC  arch/x86/tools/relocs_64.o
    CC      scripts/mod/empty.o
    HOSTCC  scripts/mod/mk_elfconfig
    HOSTCC  arch/x86/tools/relocs_common.o
    CC      scripts/mod/devicetable-offsets.s
    HOSTLD  arch/x86/tools/relocs
    HOSTCC  scripts/selinux/genheaders/genheaders
    HOSTCC  scripts/selinux/mdp/mdp
    MKELF   scripts/mod/elfconfig.h
    CHK     scripts/mod/devicetable-offsets.h
    UPD     scripts/mod/devicetable-offsets.h
    HOSTCC  scripts/mod/sumversion.o
    HOSTCC  scripts/kallsyms
    HOSTCC  scripts/mod/modpost.o
    HOSTCC  scripts/conmakehash
    HOSTCC  scripts/recordmcount
    HOSTCC  scripts/sortextable
    HOSTCC  scripts/asn1_compiler
    HOSTCC  scripts/mod/file2alias.o
    HOSTCC  scripts/sign-file
scripts/sign-file.c:25:30: fatal error: openssl/opensslv.h: No such file or directo
ry
compilation terminated.
scripts/Makefile.host:90: recipe for target 'scripts/sign-file' failed
make[1]: *** [scripts/sign-file] Error 1
make[1]: *** Waiting for unfinished jobs....
    HOSTLD  scripts/mod/modpost
Makefile:557: recipe for target 'scripts' failed
make: *** [scripts] Error 2
make: *** Waiting for unfinished jobs....
```

解决方法：这是由于缺少相关库所致，安装libssl-dev即可

安装命令：sudo apt-get install libssl-dev

6. 进行内核编译make时，出现以下错误：

```
ld: final link failed: sound/soc/codecs/snd-soc-wm8580.ko: final close failed: N
o space left on device
No space left on device
scripts/Makefile.modpost:129: recipe for target 'sound/soc/codecs/snd-soc-wm8580
.ko' failed
make[1]: *** [sound/soc/codecs/snd-soc-wm8580.ko] Error 1
make[1]: *** Waiting for unfinished jobs....
scripts/Makefile.modpost:129: recipe for target 'sound/soc/codecs/snd-soc-wm8711
.ko' failed
make[1]: *** [sound/soc/codecs/snd-soc-wm8711.ko] Error 1
sound/soc/codecs/snd-soc-cs42l52.ko: final close failed: No space left on device
scripts/Makefile.modpost:129: recipe for target 'sound/soc/codecs/snd-soc-cs42l5
2.ko' failed
make[1]: *** [sound/soc/codecs/snd-soc-cs42l52.ko] Error 1
Makefile:1215: recipe for target 'modules' failed
make: *** [modules] Error 2
```

解决方法：

硬盘空间不足，建议硬盘空间分配32G以上。如果本地磁盘空间不够用的话，建议你make localmodconfig，使用这个config大概只生成6G的中间文件，过程大概只需要15分钟。

7. 进行内核模块安装make modules_install时，出现以下错误：

```
jin@ubuntu:~/linux-4.19.23$ make modules_install
mkdir: cannot create directory '/lib/modules/4.19.23': Permission denied
Makefile:1251: recipe for target '_modinst_' failed
make: *** [_modinst_] Error 1
```
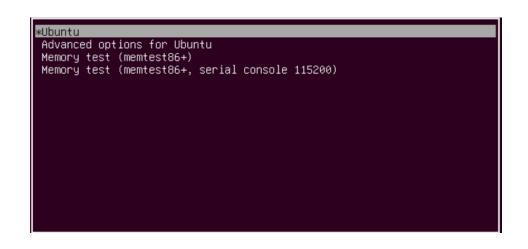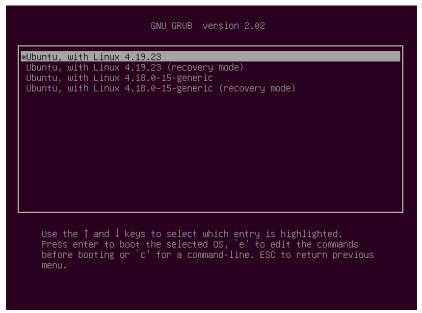
解决方法：

解决方法：这是由于缺少权限，使用sudo命令安装即可

安装命令： sudo make modules_install

8. 内核安装完毕后，重启仍然无法选择内核版本。

解决方法：重启电脑，按住Shitf键，进入Advanced options for Ubuntu 即可选择内核版本

9. 重启无法进入系统，停留在了busybox里。
目前还没有什么解决办法。建议重装，再次尝试。


```
input_len: 0x00000000007c0ac1
output: 0x0000000001000000
output_len: 0x00000000001d1514c
kernel_total_size: 0x0000000001a2c000
trampoline_32bit: 0x000000000009c000
booted via startup_32()
Physical KASLR using RDTSC...
Virtual KASLR using RDTSC...

Decompressing Linux... Parsing ELF... Performing relocations... done.
Booting the kernel.
[    0.142372] Spectre V2 : Spectre mitigation: LFENCE not serializing, switchin
g to generic retpoline
Gave up waiting for root file system device.  Common problems:
 - Boot args (cat /proc/cmdline)
   - Check rootdelay= (did the system wait long enough?)
 - Missing modules (cat /proc/modules; ls /dev)
ALERT!  UUID=5b77ffdb-5299-4e05-8b49-a4e678399c63 does not exist.  Dropping to a
 shell!


BusyBox v1.27.2 (Ubuntu 1:1.27.2-2ubuntu3) built-in shell (ash)
Enter 'help' for a list of built-in commands.

(initramfs) _
```