

## Instruções passo a passo

### 1. Baixar o compilador gcc do arm64

```
user@pc$~: sudo apt install gcc-aarch64-linux-gnu
```

### 1. Baixar o código-fonte do kernel Linux 6.12.48

O código-fonte do kernel está disponível no [site oficial](https://www.kernel.org) do Linux Kernel.

1. Acesse o diretório de trabalho:

```
user@pc$~: mkdir ~/kernel
```

```
user@pc$~: cd kernel
```

2. Baixe o código-fonte do kernel 6.12.48:

```
sudo wget
https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux.git/snapshot/linux-6.12.48.tar.gz
```

3. Extraia o arquivo:

```
sudo tar -xvf linux-6.12.48.tar.gz && cd linux-6.12.48
```

```
alexmonteiro@ppgi-pc:~/kernel$
alexmonteiro@ppgi-pc:~$ wget https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux.git/snapshot/linux-6.12.48.tar.gz
--2025-11-13 13:46:21-- https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux.git/snapshot/linux-6.12.48.tar.gz
Resolving git.kernel.org (git.kernel.org)... 2600:3c04:e001:324:0:1991:8:25, 172.105.4.254
Connecting to git.kernel.org (git.kernel.org)|2600:3c04:e001:324:0:1991:8:25|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/x-gzip]
Saving to: 'linux-6.12.48.tar.gz'

linux-6.12.48.tar.gz
<=> [ 233,96M 7,37MB/s in 27s

2025-11-13 13:46:49 (8,72 MB/s) - 'linux-6.12.48.tar.gz' saved [245324438]

alexmonteiro@ppgi-pc:~$ tar -xvf linux-6.12.48.tar.gz && cd linux-6.12.48
linux-6.12.48/
linux-6.12.48/.clang-format
linux-6.12.48/.clippy.toml
linux-6.12.48/.cocciconfig
linux-6.12.48/.editorconfig
linux-6.12.48/.get_maintainer.ignore
linux-6.12.48/.gitattributes
linux-6.12.48/.gitignore
linux-6.12.48/.mailmap
linux-6.12.48/.rustfmt.toml
linux-6.12.48/COPYING
linux-6.12.48/CREDITS
linux-6.12.48/Documentation/
linux-6.12.48/Documentation/.gitignore
linux-6.12.48/Documentation/ABI/
linux-6.12.48/Documentation/ABI/README
linux-6.12.48/Documentation/ABI/obsolete/
linux-6.12.48/Documentation/ABI/obsolete/o2cb
linux-6.12.48/Documentation/ABI/obsolete/procfs-i8k
linux-6.12.48/Documentation/ABI/obsolete/sysfs-bus-iiio
linux-6.12.48/Documentation/ABI/obsolete/sysfs-bus-usb
linux-6.12.48/Documentation/ABI/obsolete/sysfs-class-typec
linux-6.12.48/Documentation/ABI/obsolete/sysfs-cpuidle
linux-6.12.48/Documentation/ABI/obsolete/sysfs-driver-hid-roccat-arvo
linux-6.12.48/Documentation/ABI/obsolete/sysfs-driver-hid-roccat-isku
linux-6.12.48/Documentation/ABI/obsolete/sysfs-driver-hid-roccat-koneplus
linux-6.12.48/Documentation/ABI/obsolete/sysfs-driver-hid-roccat-konepure
linux-6.12.48/Documentation/ABI/obsolete/sysfs-driver-hid-roccat-kovapulus
linux-6.12.48/Documentation/ABI/obsolete/sysfs-driver-hid-roccat-lua
linux-6.12.48/Documentation/ABI/obsolete/sysfs-driver-hid-roccat-pyra
```

## 2. Configurar o Kernel

1. Gere o arquivo de configuração padrão:

```
make defconfig
```

## 3. Compilar o kernel

1. Compilar o kernel pode levar algum tempo, dependendo do hardware do sistema:

```
make -j$(nproc) ARCH=arm64 CROSS_COMPILE=aarch64-linux-gnu-
```

## 3. Compilar o kernel module

1. Alterar o KDIR para PATH do Kernel baixado

```
user@pc$: nano Makefile
```

```
KDIR ?= /home/username/kernel/linux-6.12.48
```

### 2. Compilar kernel module

```
make ARCH=arm64 CROSS_COMPILE=aarch64-linux-gnu-
```

```
alexmonteiro@ppgi-pc:~/JoystickRaspberry-HandsOn-DevTitans/driver$ nano Makefile
alexmonteiro@ppgi-pc:~/JoystickRaspberry-HandsOn-DevTitans/driver$ make ARCH=arm64 CROSS_COMPILE=aarch64-linux-gnu-
make -C /home/alexmonteiro/kernel/linux-6.12.48 M=/home/alexmonteiro/JoystickRaspberry-HandsOn-DevTitans/driver modules
make[1]: Entering directory '/home/alexmonteiro/kernel/linux-6.12.48'
  CC [M] /home/alexmonteiro/JoystickRaspberry-HandsOn-DevTitans/driver/joy_driver_module.o
  MODPOST /home/alexmonteiro/JoystickRaspberry-HandsOn-DevTitans/driver/Module.symvers
  CC [M] /home/alexmonteiro/JoystickRaspberry-HandsOn-DevTitans/driver/joy_driver_module.mod.o
  CC [M] /home/alexmonteiro/JoystickRaspberry-HandsOn-DevTitans/driver/.module-common.o
  LD [M] /home/alexmonteiro/JoystickRaspberry-HandsOn-DevTitans/driver/joy_driver_module.ko
make[1]: Leaving directory '/home/alexmonteiro/kernel/linux-6.12.48'
```

3. Copiar .ko para o AOSP e montar a imagem