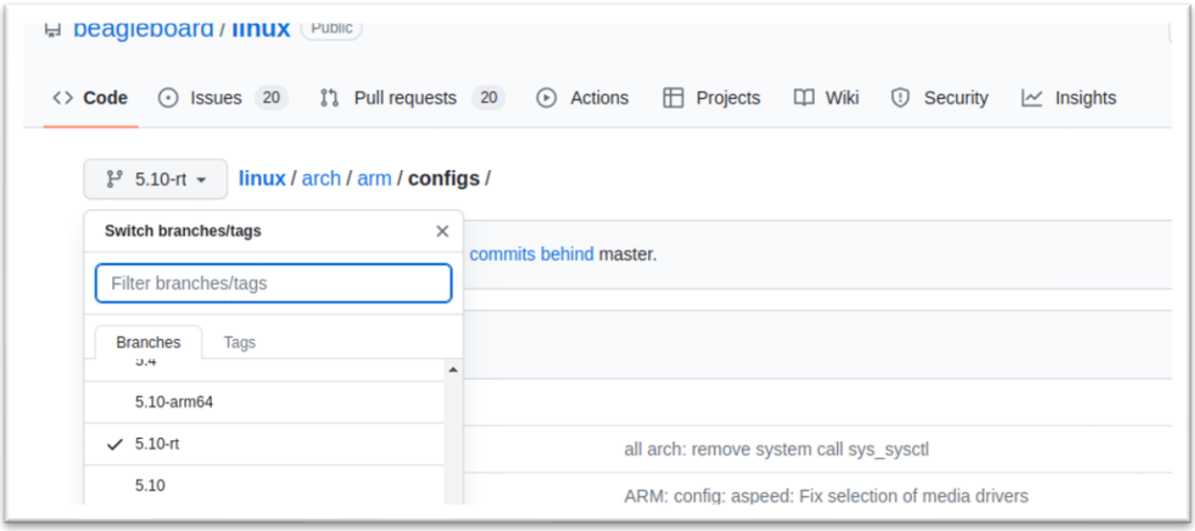
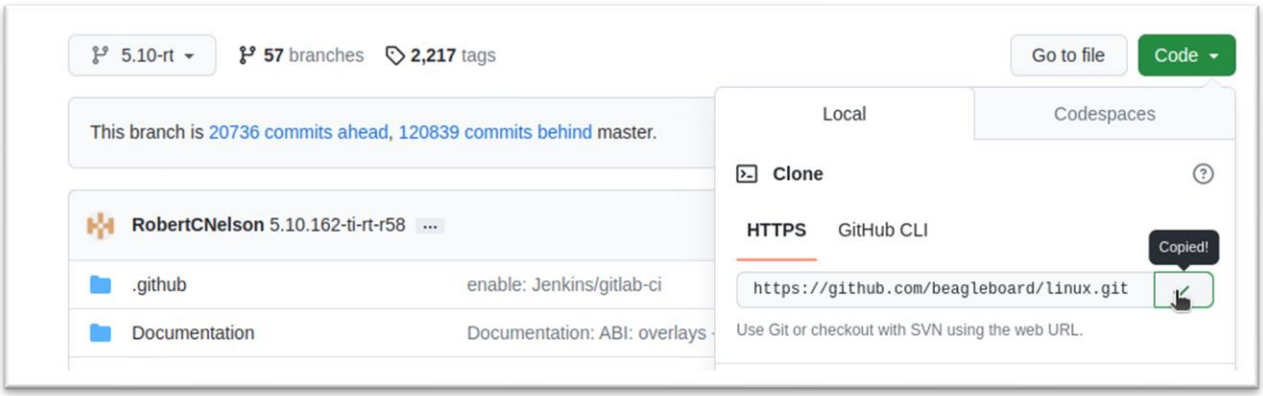
Updating latest Kernel image v5.10

Step 1: Selecting Latest Kernel Source.

- Go to the Beagle Board GitHub repository located at https://github.com/beagleboard/linux.
- Switch to the branch 5.10-rt (Here you will find bb.org_defconfig)

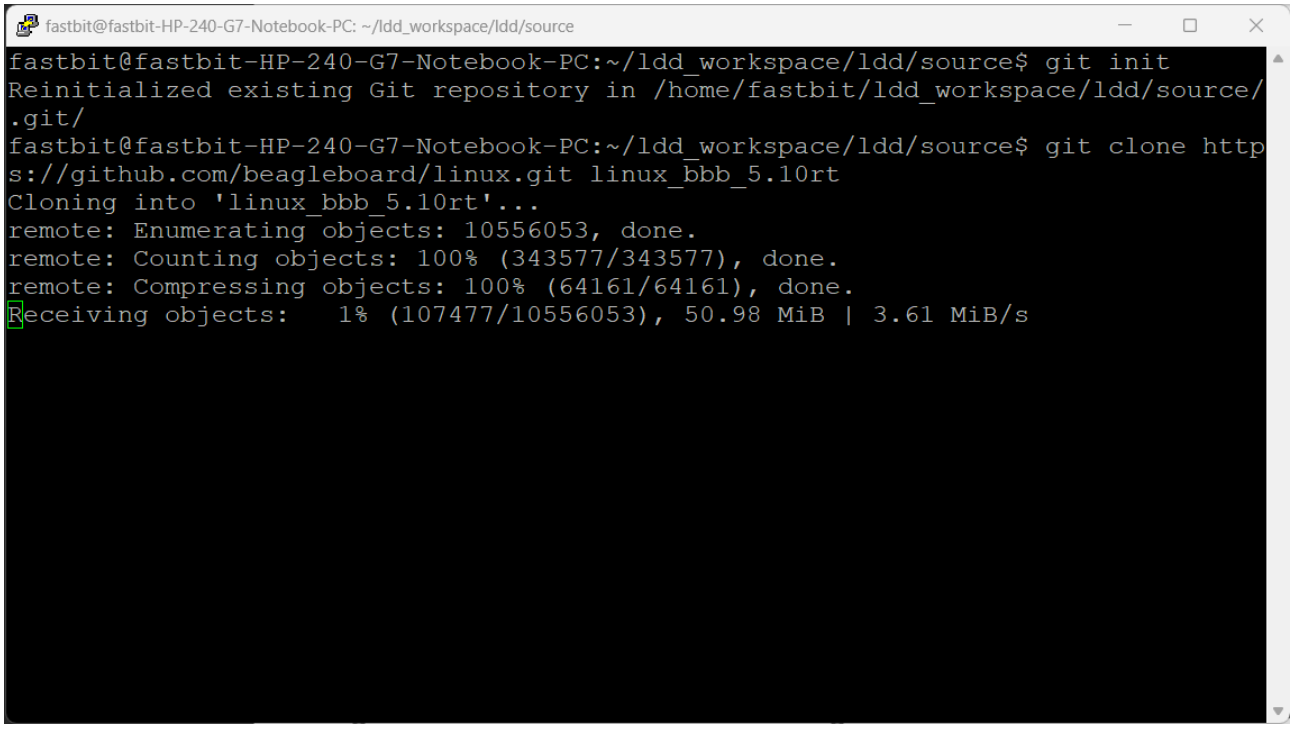


- Copy the link in the code option.



Step 2: Clone the Kernel Source.

- Open the terminal and navigate to the source folder of your workspace. Once you are in the desired directory, run the command.
  git init
- After initializing the Git repository, you can proceed to clone the repository by pasting the copied URL from Git and providing a name for the cloned repository. Here is the command:
  git clone https://github.com/beagleboard/linux.git
- Execute the command "git checkout 5.10-rt" to switch to the desired branch in the Git repository.



Step 3: Kernel Compilation steps.

Install these 2 interface libraries using the below commands.

```
sudo apt-get install-y libgmp-dev
sudo apt-get install libmpc-dev
```

1. Removes all the temporary folder, object files, images generated during the previous build. This step also deletes the .config file if created previously.

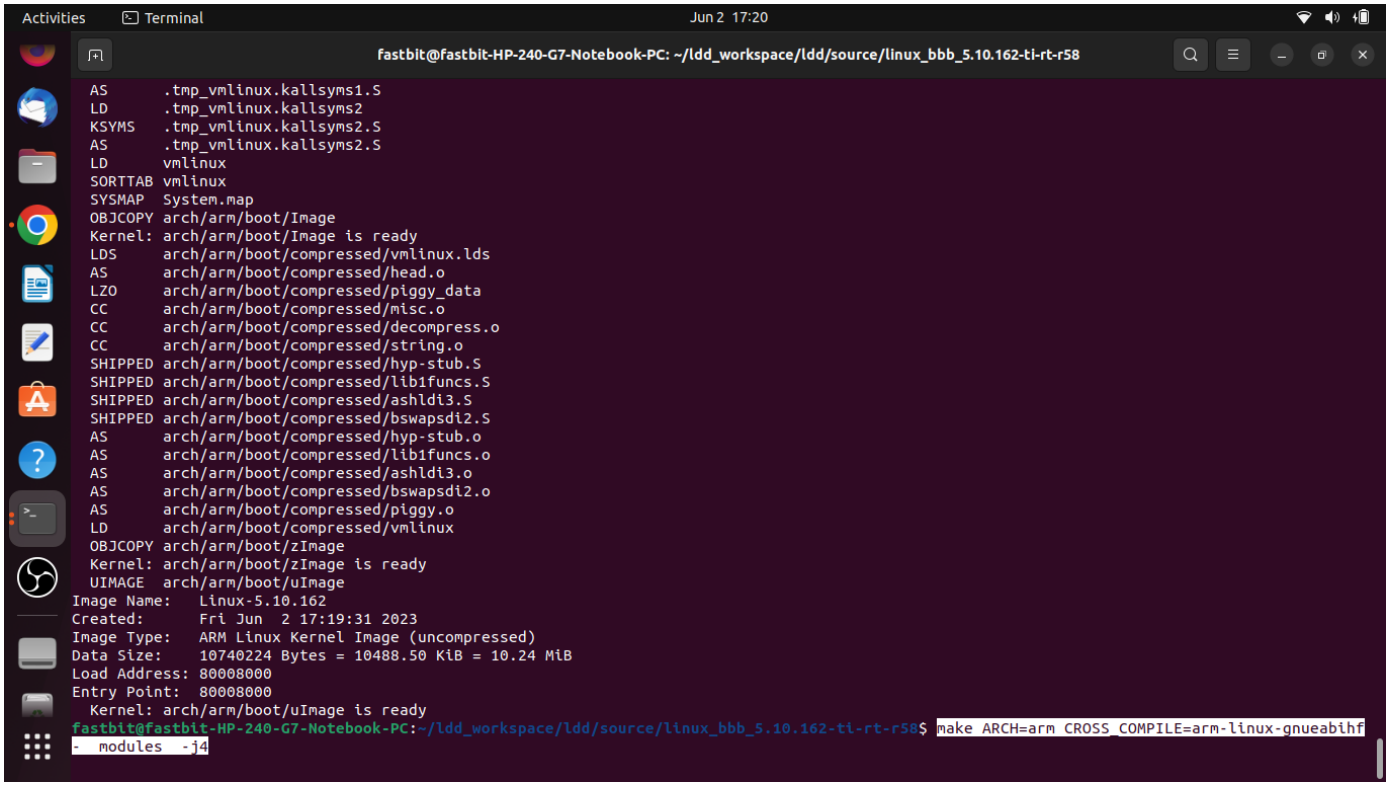
   ```
   make make ARCH=arm distclean
   ```

2. creates a .config file by using default config file given by the vendor.

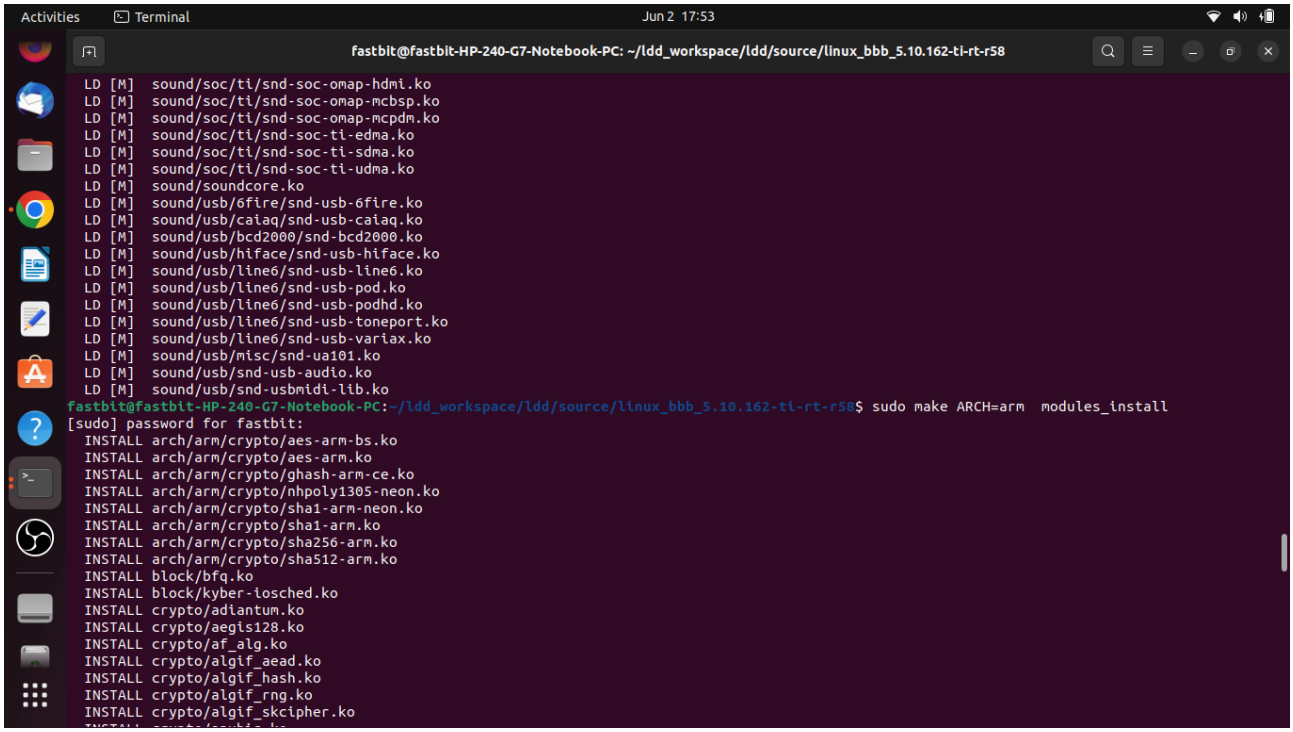
   ```
   make ARCH=arm bb.org_defconfig
   ```

3. This step is optional. Run this command only if you want to change some kernel settings before compilation.
   ```
   make ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf- menuconfig
   ```

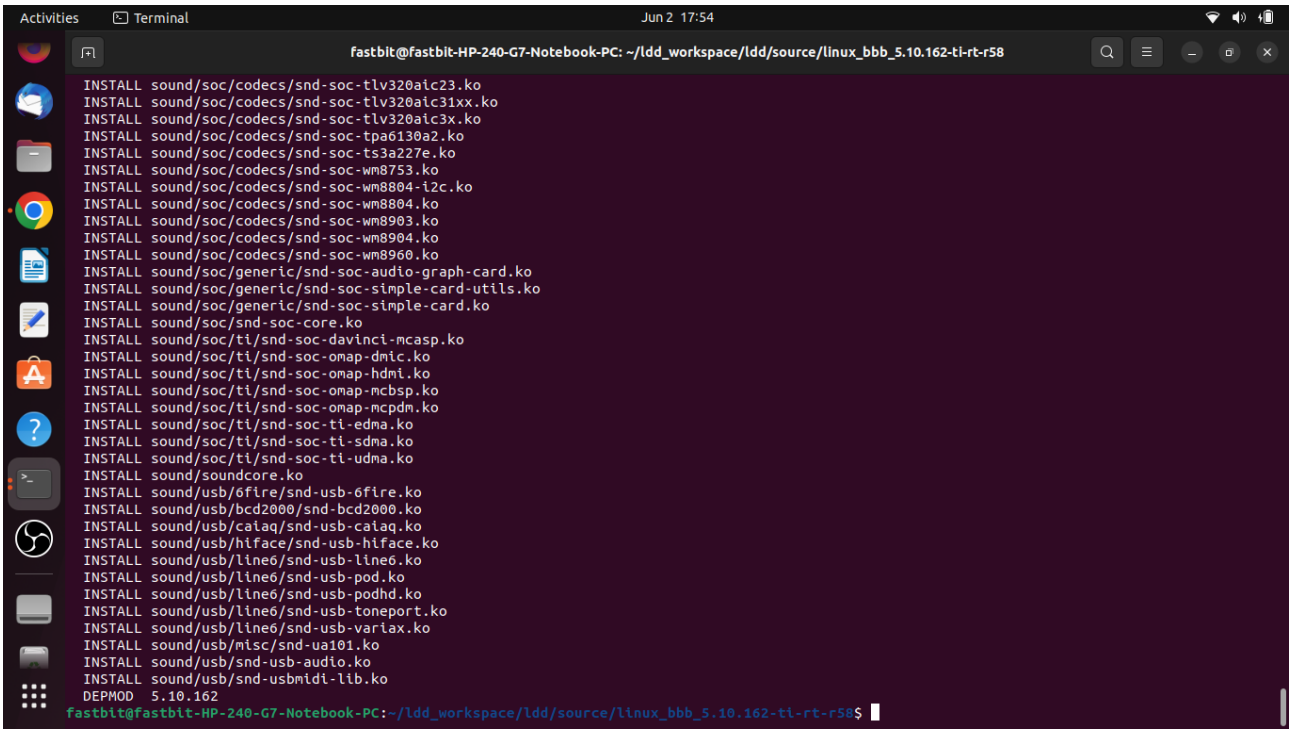
4. Kernel source code compilation. This stage creates a kernel image "uImage" also all the device tree source files will be compiled, and dtbs will be generated.
   ```
   make ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf- uImage dtbs LOADADDR=0x80008000-j4
   ```



5. This step builds and generates in-tree loadable(M) kernel modules(.ko).
   make ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf- modules-j4



6. This step installs all the generated .ko files in the default path of the computer (/lib/modules/<kernel_ver>).
   sudo make ARCH=arm modules_install



Step 4: Updating uImage, DTB and Copying Modules to SD Card.

1. Insert the SD card into a card reader and open it on your computer.
   - Access the boot partition.
   - Rename the existing uImage file to a different name.
2. Open the terminal and navigate to the source directory:
   `cd linux_bbb_5.10.162-ti-rt-r58/arch/arm/boot/`
3. Copy the uImage file to the SD card's boot partition:
   `cp uImage /media/<username>/BOOT/`
4. Open the /lib/modules/ directory and - Copy the newly created folder to the SD card's root file system:
   `cd /lib/modules/`
   `ls`
   `sudo cp -a 5.10.162-ti-rt-r58/ /media/<username>/ROOTFS/lib/modules/`
5. Sync the changes to ensure data is written to the SD card properly:
   `sync`
6. Open the source directory in the terminal.
   - Navigate to /arch/arm/boot/dts
   - Copy the **dtb** file to **the BOOT partition** using the command "`cp am335x-boneblack.dtb /media/<username>/BOOT/`".