ESE 2025 Linux Kernel Build Report Part 1
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Summary of the video from:
https://github.com/takiszourntos/teaching/blob/master/instructional/BB_kernel_build/kernel_build_1.mp4
This report is on purpose of a summary from a video on how to build a new Kernel on Beaglebone than run on real-time.
Steps:
To install a new kernel on Beaglebone (cross compiler is required).
First thing to do is clone beaglebone kernel source
- access git repository by RoberthChelson and clone it
- list branches
- choose version 4.9 (building real time kernel) - git checkout [version]is the command
- create our own branch
- **install some software in build_kernel.sh (run bash script)
- config menu comes up
- set up full real time operation
  - go to kernel feature
  - Preemption Model (Fully Preemptible Kernel) < select it
  - CPU power management (other choices should be considered)
  - ->CPU Frequency Scaling to enable or disable different governor for speed
  - save
- save & exit

Back to desktop terminal
- check for deploy
- in deploy there are all relevant files
- cat config file to look for real - time relevant files “PREEMPT” for more descripted
- -> CONFIG_PREEMPT_RT_FULL=y < key we want to set

Beaglebone is connect with debug cable
- cd to root/boot ($/boot) (Linux kernel partly live in here - core file)
- You can explore around on these files:
  - file vmlinuz -> linux kernel ARM boot executable zimage
  - *more uEnv.txt file*
- cd to dtbs (device tree binary set up)

Now, in this step, we make some directories that simiar to those on the Beaglebone machine, to prepare for the deployment from host to Beaglebone

Make some directory on host machine
- dtbs, firmware, modules
- mv 4.9 version of each above to respective directories.
- extracting each of them
  - make a directory with kernel designation version
  - move everything with except tar.gzto this directory
  - then remove the tar.gz file to release space
- Repeat steps to other directories.

2nd part is to show how to deploy them from the host machine to Beaglebone.