Embedded Linux Z2HV2

Assignment 3 - Buildroot

The First Build

# Summary:

The goal of this Assignment is to build a simple image for the raspberry pi using Buildroot, with default configuration.

# Requirements:

-The buildroot project (Tag: 2019.11.1) - Either download a clean repo from <http://git.buildroot.net/buildroot/> or use the repo provided at the lecture with necessary downloads included (buildroot.7z, dl.7z).

-Network Connection to your laptop in case of a clean buildroot repo.

-A Raspberry Pi and your own SDcard.

-Your Prefered Hardware connection (Serial, Ethernet), we learned the basic concept for connecting via each one.

# Steps:

**Getting the build environment ready:**

-Install the buildroot dependencies libncurses-dev, python, gcc, g++, git

-Uncompress the dl.7z into the buildroot/ directory.

-Open terminal in the buildroot/ directory (that is also a git repo).

-to view all available versions in your buildroot repo use: git tag

-to checkout a certain version of buildroot use: git checkout 2019.11.1

-Now the environment is ready. (**note**: if you used the provided buildroot repo make sure to reset all the changes before you start using: git reset --hard).

**Navigate and do basic configuration:**

-Buildroot has some default configuration for the supported boards like the raspberry pi. To view all the supported configuration use this command in the buildroot directory:

make list-defconfigs

-Now we need to apply the default configuration for our raspberry pi:

make raspberrypi3\_64\_defconfig

-To view and edit the configuration one by one we will use the menuconfig:

$make menuconfig

-We need to add support for ssh in our image. search for“openssh” (use “**/**” to search for it quickly or try navigating to the option without the search feature).

-if you use search feature press “result number” in our case “1” to navigate to the option.

-Press “y” to select the option or use “space” to toggle the selection.

-To speed up the next builds we will enable the compiler cache feature in buildroot (more on that in the lecture)

-Search/navigate to “ccache**”** and enable it like you did for “openssh”.

-use “tab” to navigate to the “save” option at the bottom and click enter to save your changes.

-press “ESC” to exit.

**Starting the build and test the output:**

-You can start the build simply by typing make command, but we will use some combined commands to collect some information about our build in order to use them later for debugging if the build failed. Use:

time make 2>&1 | tee build.log

The time command will calculate the time the build took.

The “tee” command redirects the build output to 2 streams, the STDOUT and a file for later inspection.

-After the build is completed you should find the output image in the output directory output/images with the name “sdcard.img”.

-Flash the image on your SD card using the “dd” command then try to boot the raspberry pi and login to a serial terminal(**note**: the default user is “root” with no password).

-You can also try to login via SSH terminal (**note**: rewards to whom will do it via ethernet, bigger rewards for who can do it via WIFI ^^ -recognition only if done in groups-).

# How to deliver your work:

-Each Student should complete the build on his own machine.

-Each Student should Submit his “build.log” file created from the build process on his machine.

-Each Student should test his image on his own.

-On lecture i will check that each group has at least one member who completed the assignment and will ask about the steps and inspect the output build/image.