



File:Make xconfig.png

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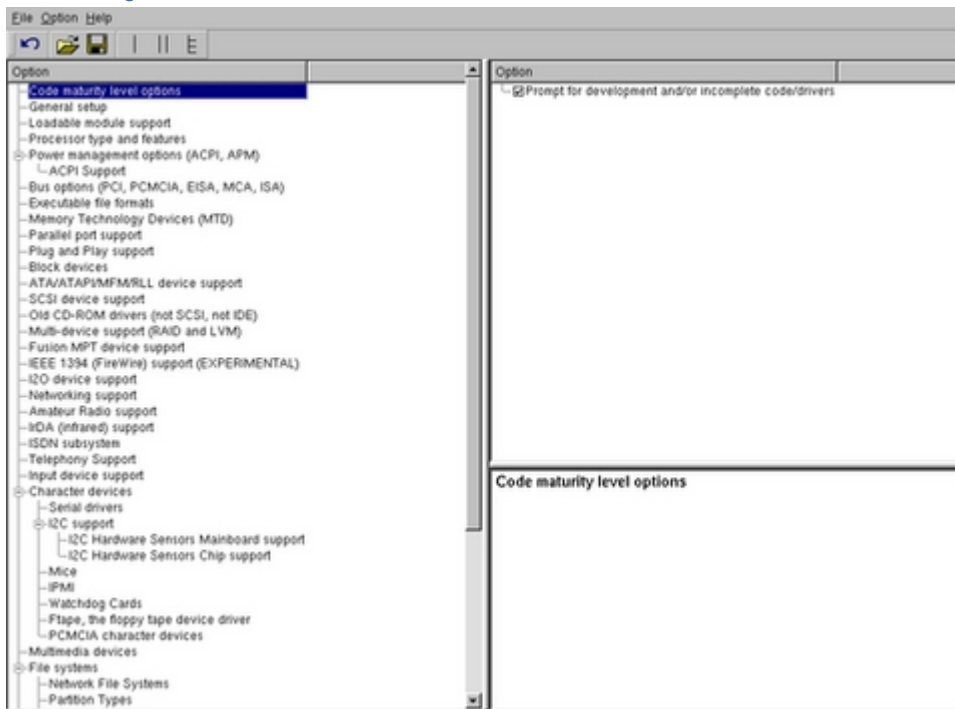


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No higher resolution available.

Make_xconfig.png (480 × 352 pixels, file size: 55 KB, MIME type: image/png)

A quality version of this page, approved on 17 June 2020, was based off this revision.

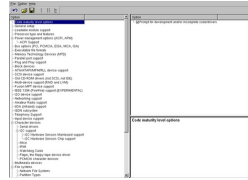


Source
STMicroelectronics



File history

Click on a date/time to view the file as it appeared at that time.

	Date/Time	Thumbnail	Dimensions	User	Comment
current	14:16, 24 October 2018		480 × 352 (55 KB)	Bfrq08554 (talk contribs)	

- You cannot overwrite this file.



File usage

The following page links to this file:

- [Menuconfig or how to configure kernel](#)
Stable: 31.03.2021 - 08:47 / Revision: 26.03.2021 - 08:44

A quality version of this page, approved on 31 March 2021, was based off this revision.

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1 Linux configuration genericity

The process of building a kernel has two parts: configuring the kernel options and building the source with those options.

The Linux[®] kernel configuration is found in the generated file: `.config`.

`.config` is the result of configuring task which is processing platform `defconfig` and fragment files if any.

For OpenSTLinux distribution the `defconfig` is located into the kernel source code and fragments into `stm32mp` BSP layer :

- `arch/arm/configs/multi_v7_defconfig`

Every new kernel version brings a bunch of new options, we do not want to back port them into a specific `defconfig` file each time the kernel releases, so we use the same `defconfig` file based on ARM SoC v7 architecture.

STM32MP1 specificities are managed with fragments `config` files.

- `meta-st/meta-st-stm32mp/recipes-kernel/linux/linux-stm32mp/<kernel version>/fragment-*.config`

`.config` result is located in the build folder:

- `build-openstlinuxweston-stm32mp1/tmp-glibc/work/stm32mp1-ostl-linux-gnueabi/linux-stm32mp/5.10.10-rc0/build/.config`

To modify the kernel options, it is not recommended to edit this file directly.

- A user runs either a text-mode :

PC `$>` `make config`
starts a character based question and answer session (Figure 1)

```
[greg@shamp linux-2.5]$ make config
make[1]: `scripts/kconfig/conf' is up to date.
./scripts/kconfig/conf arch/i386/Kconfig
#
# using defaults found in .config
#
*
* Linux Kernel Configuration
*
* Code maturity level options
*
Prompt for development and/or incomplete code/drivers (EXPERIMENTAL) [Y/n/?]
```

Figure 1. Configuring the kernel with `make config`

PC `$>` `make menuconfig`
starts a terminal-oriented configuration tool (using `ncurses`) (Figure 2)
The `ncurses` text version is more popular and is run with the `make menuconfig` option.
[Wikipedia Menuconfig^{\[1\]}](#)
^[1] also explains how to "navigate" within the configuration menu, and highlights main key strokes.

configurator :

- or a graphical kernel



Figure 2. Make menuconfig makes it easier to back up and correct mistakes

PC \$> make xconfig starts a X based configuration tool (Figure 3)

Ultimately these configuration tools edit the .config file.

An option indicates either some driver is built into the kernel ("=y") or will be built as a module ("=m") or is not selected.

The unselected state can either be indicated by a line starting with "#" (e.g. "# CONFIG_SCSI is not set") or by the absence of the relevant line from the .config file.

The 3 states of the main selection option for the SCSI subsystem (which actually selects the SCSI mid level driver) follow. Only one of these should appear in an actual .config file:

```
CONFIG_SCSI=y
CONFIG_SCSI=m
# CONFIG_SCSI is not set
```

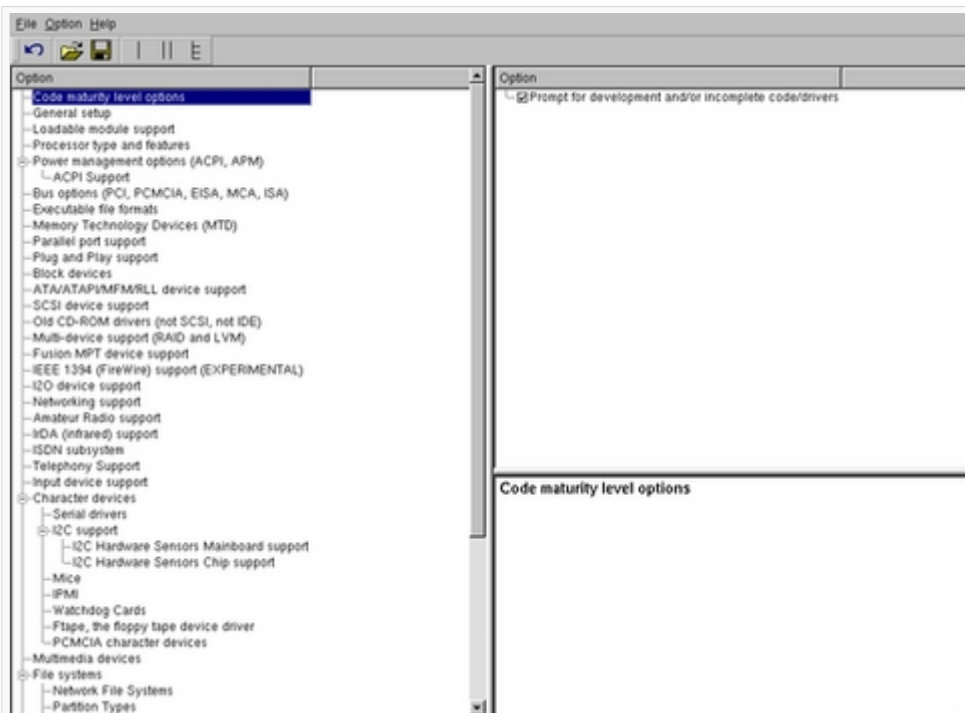


Figure 3. The Qt-Based make xconfig



2 Menuconfig and Developer Package

For this use case, the prerequisite is that OpenSTLinux SDK has been installed and configured.

To verify if your cross-compilation environment has been put in place correctly, run the following command:

```
PC $> set | grep CROSS
CROSS_COMPILE=arm-ostl-linux-gnueabi-
```

For more details, refer to <Linux kernel installation directory>/README.HOW_TO.txt helper file (the latest version of this helper file is also available in GitHub: [README.HOW_TO.txt](#)).

- Go to the <Linux kernel build directory>

```
PC $> cd <Linux kernel build directory>
```

- Save initial configuration (to identify later configuration updates)

```
PC $> make arch=ARM savedefconfig
Result is stored in defconfig file
PC $> cp defconfig defconfig.old
```

- Start the Linux kernel configuration menu

```
PC $> make arch=ARM menuconfig
```

- Navigate forwards or backwards directly between feature
 - un/select, modify feature(s) you want
 - When the configuration is OK : exit and save the new configuration

```
useful keys to know:
enter: enter in config subdirectory
space: hit several times to either select [*], select in module [m] or unselect [ ]
/: to search for a keyword, this is usefull to navigate in tree
?: to have more information on selected line
```

- Compare the old and new config files after operating modifications with menuconfig

```
PC $> make arch=ARM savedefconfig
```

Retrieve configuration updates by comparing the new defconfig and the old one

```
PC $> meld defconfig defconfig.old
```

- Cross-compile the Linux kernel (please check the load address in the *README.HOW_TO.txt* helper file)



```
PC $> make arch=ARM uImage LOADADDR=<loadaddr of kernel>  
PC $> cp arch/arm/boot/uImage install_artifact/boot/
```

- Update the Linux kernel image on board

```
PC $> scp install_artifact/boot/uImage root@<board ip address>:/boot/
```

Information

If the `/boot` mounting point doesn't exist yet, please see [how to create a mounting point](#)

- Reboot the board

```
Board $> cd /boot; sync; systemctl reboot
```

Note that this use case modifies the configuration file in the Linux kernel build directory, not in the Linux kernel source directory: this is a temporary modification useful for a prototyping.

- To make this temporary modification permanent, the delta between `defconfig` and `defconfig.old` must be saved in a configuration fragment file (`fragment-*.config`) based on `fragment.cfg` file, and the Linux kernel configuration/compilation steps must be re-executed (as explained in the `README.HOW_TO.txt` helper file).



3 Menuconfig and Distribution Package

- Start the Linux kernel configuration menu

```
PC $> bitbake virtual/kernel -c menuconfig
```

- Navigate forwards or backwards directly between feature
 - un/select, modify feature(s) you want
 - When the configuration is OK : exit and save the new configuration

```
useful keys to know:
enter: enter in config subdirectory
space: hit several times to either select [*], select in module [m] or unselect [ ]
/: to search for a keyword, this is usefull to navigate in tree
?: to have more information on selected line
```

- Cross-compile the Linux kernel

```
PC $> bitbake virtual/kernel
```

- Update the Linux kernel image on board

```
PC $> scp <build dir>/tmp-glibc/deploy/images/<machine name>/uImage root@<board ip address>:/boot
```

Information

If the `/boot` mounting point does not exist yet, please see [how to create a mounting point](#)

- Reboot the board

```
Board $> cd /boot; sync; systemctl reboot
```

Note that this use case modifies the configuration file in the Linux kernel build directory, not in the Linux kernel source directory: this is a temporary modification useful for a prototyping.

- To make this temporary modification permanent, it must be saved in a configuration fragment file (fragment-*.config) based on `fragment.cfg` file, and the Linux kernel configuration/compilation steps must be re-executed: `bitbake <name of kernel recipe>`.



4 References

- [Wikipedia Menuconfig](#)