License compliance for embedded Linux devices with Buildroot

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About me

- Embedded Linux engineer at AIM Sportline
  www.aim-sportline.com
  - Develop products on custom hardware
  - Kernel, drivers, bootloader, FPGA
  - Integration, build system
- Open source enthusiast
  - Contributor to the Linux kernel, U-Boot, Buildroot and others
Buildroot
Build system

- Buildroot
- Compiler
- Linker
- Debugger
- Bootloader
- Kernel
- Libraries
- Applications
- Tools

Flow:
- Buildroot
  - Bootloader
  - Kernel
  - Root FS
  - Host tools

Connected to:
- Embedded Device

End user
Demo:

Buildroot basics
Open-source licensing
## Typical license families

**Permissive**  
(BSD, MIT, X11...)  
- Use, modify, redistribute  
- ! Provide license text

**Copyleft**  
(GPL, LGPL, AGPL...)  
- Use, modify, redistribute  
- ! Provide license text  
- ! Provide source code
Caveats

- There are many variations
- License incompatibility
- Info on websites etc might be inaccurate

→ Check the license *in the source code*
So, what do I have to do?

- Provide license text
- Store source code archives (provide them on request)
  - Including the “scripts used to control compilation and installation”
    - I.e. the entire buildsystem
Compliance tools in Buildroot
Compliance tools in Buildroot

[Diagram showing the flow of tools and components from Buildroot to Embedded Device, including Compiler, Linker, Debugger, Bootloader, Kernel, Libraries, Applications, and Tools, leading to License text, Source code, and an End user.]
Demo:

make legal-info
Implementing legal-info in Buildroot packages
Add license info to a package

package/vlc/vlc.mk

```
VLC_LICENSE = GPL-2.0+, LGPL-2.1+
VLC_LICENSE_FILES = COPYING COPYING.LIB
```

package/vlc/vlc.hash

```
sha256 8177f975...1b880643  COPYING
sha256 dc626520...032fe551  COPYING.LIB
```
Your own closed source program

package/myapp/myapp.mk

MYAPP_LICENSE = Proprietary
MYAPP_REDISTRIBUTE = NO
Source from unusual locations

- Source code is not saved when using
  - `<PKG>_OVERRIDE_SRCDIR`
  - `<PKG>_SITE_METHOD = local`
  → Avoid them when releasing
For some special packages:

- `<PKG>_SOURCE` contains binaries
- `<PKG>_ACTUAL_SOURCE` points to the tarball with the actual sources
- Only used for pre-built external toolchains
Conclusions
The Buildroot user manual
(https://buildroot.org/docs.html)

§ 12. Legal notice and licensing

§ 17.5. Infrastructure for packages with specific build systems

License Compliance in Embedded Linux with the Yocto Project, Paul Barker, ELCE 2019 (slides, video)
- Mostly buildsystem-agnostic
Questions?

Thank you for your attention!

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Extra slides
## Typical license families

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- Can use, modify
- Can redistribute
- Must provide license text
- Must provide source code
- Derived work becomes GPL