The free software desktop's graphics driver stack.

Luc Verhaegen <libv@skynet.be>

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Modular good!

- Xfree86 driver SDK installed per default.

- Autotools.

- Clearer structure.

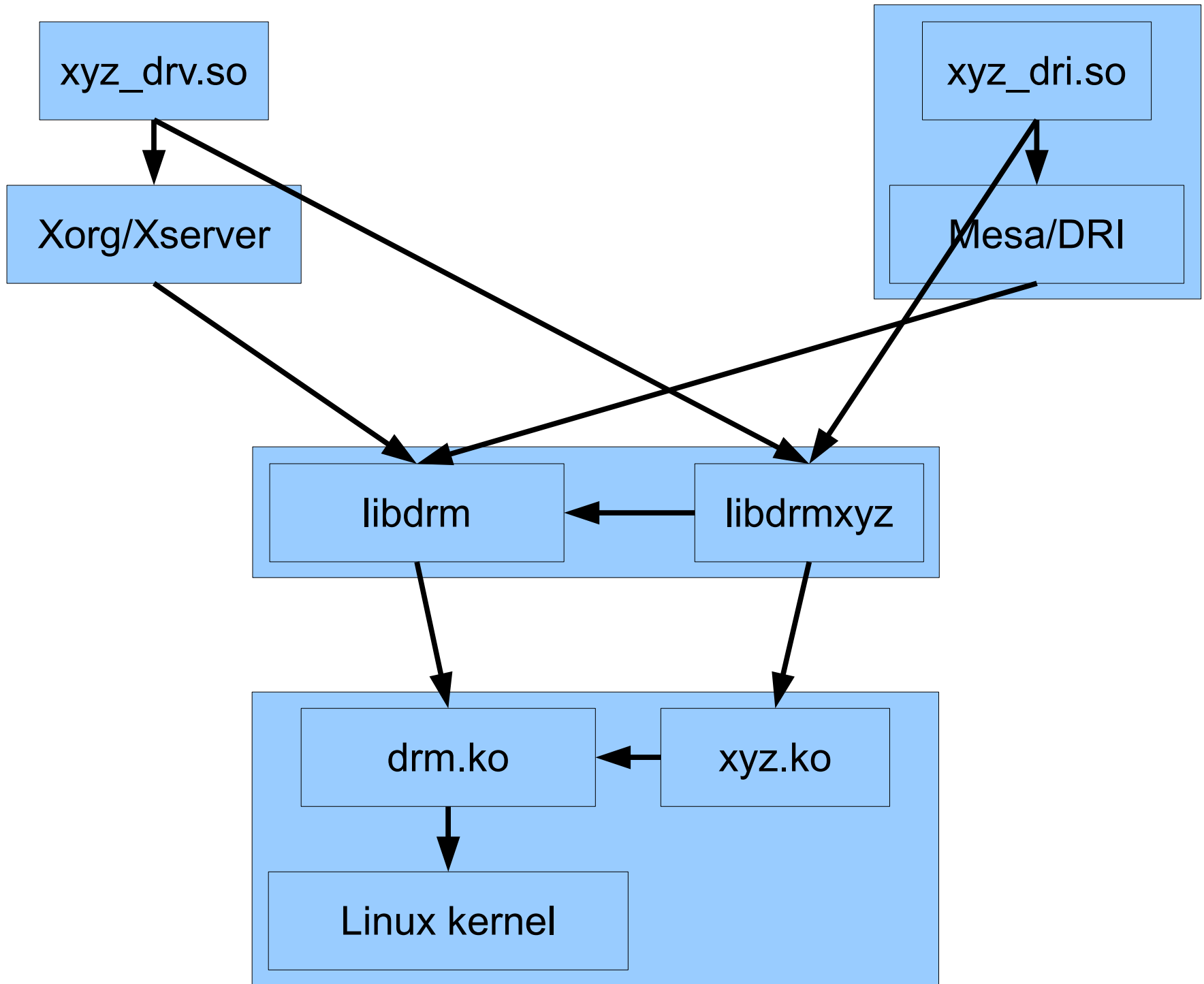- Individual parts are more accessible.

Modular bad!

- X went from highly stable to highly volatile.
- Vendors still patch their trees.
- Everything is dispersed.
- No-one builds the whole of X anymore.
- Who still tests anything today?
- Only X.

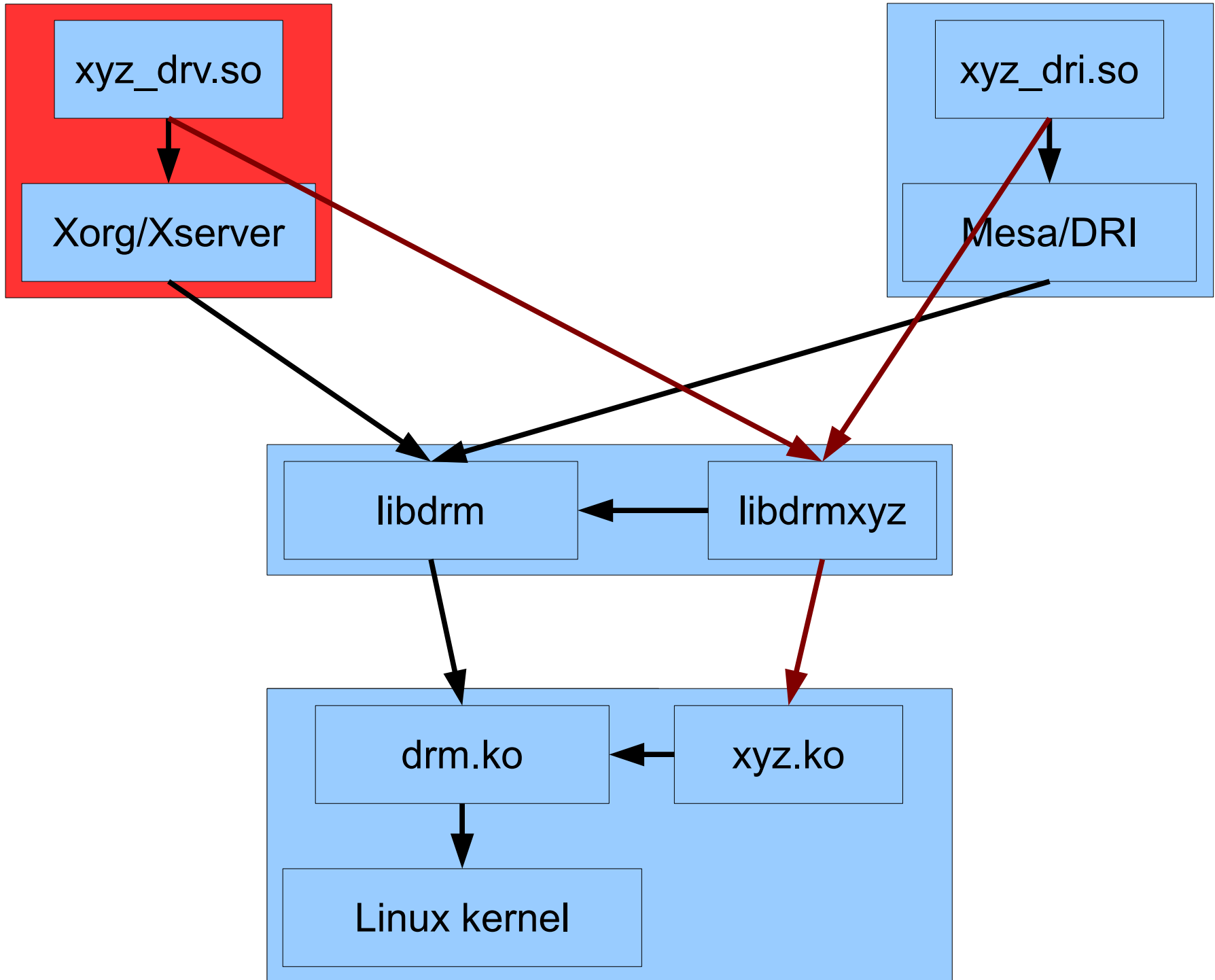# The graphics driver problem.

Survey Time!

Requirements

- Hardware vendors.

- Distributors.

- Users.

- Developers?

xyz_drv.so		xyz_dri.so
Xorg/Xserver		Mesa/DRI
libdrm	←	libdrmxyz
drm.ko	←	xyz.ko
Linux kernel		

xyz_drv.so

xyz_dri.so

Xorg/Xserver

Mesa/DRI

libdrm

libdrmxyz

drm.ko

xyz.ko

Linux kernel

xyz_drv.so

xyz_dri.so

Xorg/Xserver

Mesa/DRI

libdrm

libdrmxyz

drm.ko

xyz.ko

Linux kernel

Unichrome

XServer

1.0   1.1   1.2 1.3   1.4   1.5   1.6   1.7

Mesa/DRI

6.5.1   7.0   7.0.2   7.0.3 7.1 7.2   7.3 7.4   7.5 7.6   7.7

Linux kernel

2.6.18   2.6.24   2.6.25   2.6.26   2.6.27   2.6.28   2.6.29   2.6.30   2.6.31   2.6.32
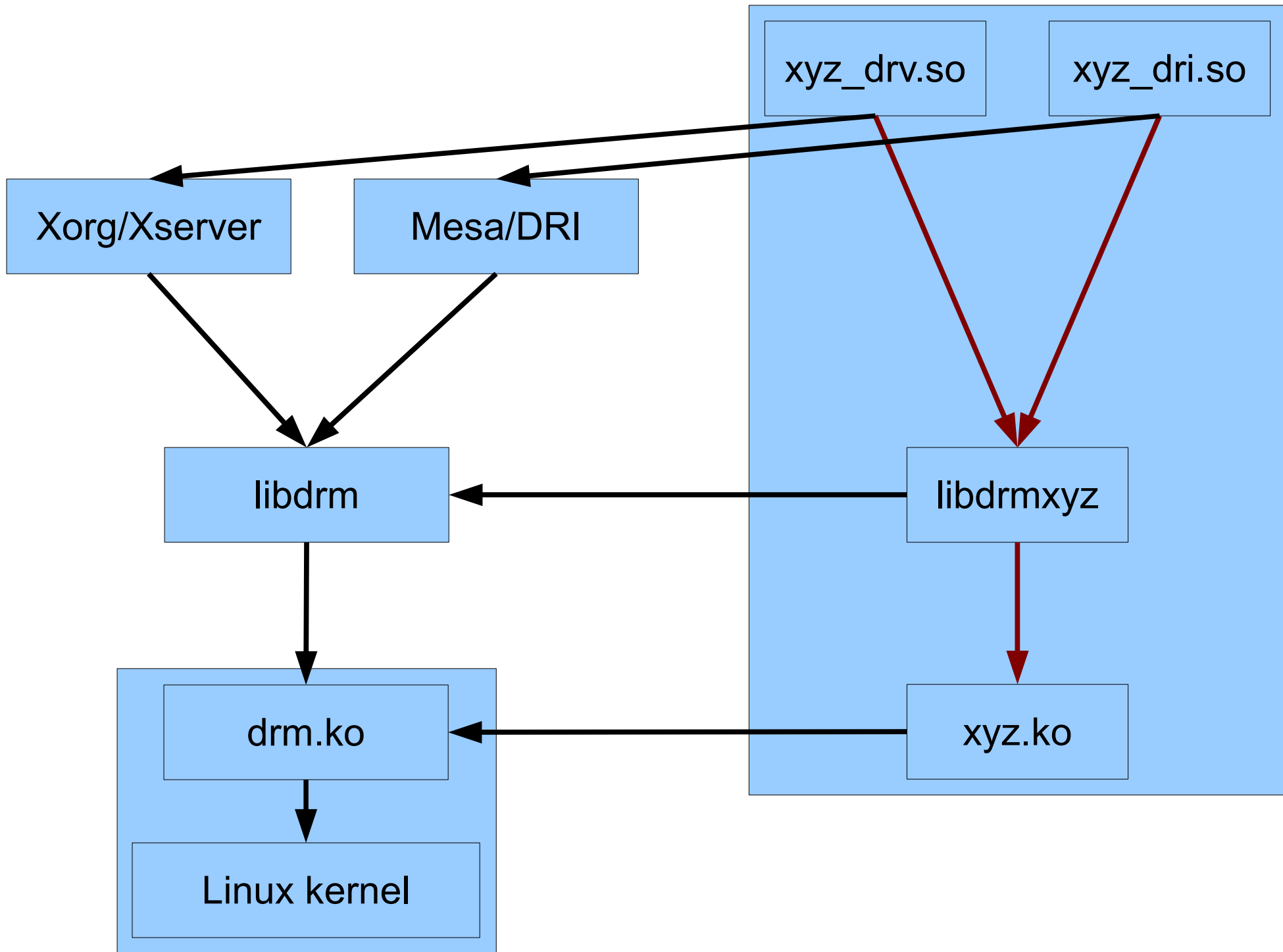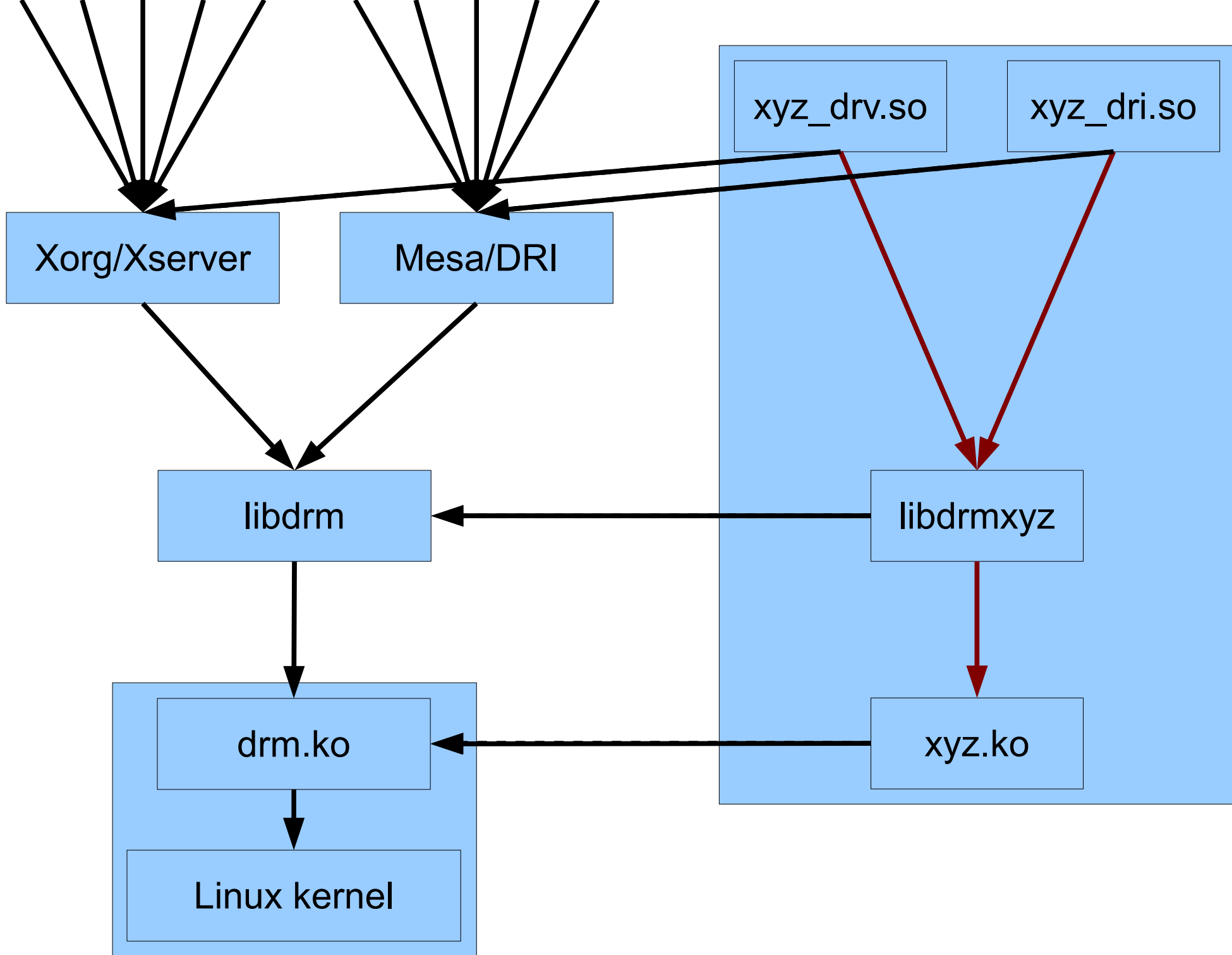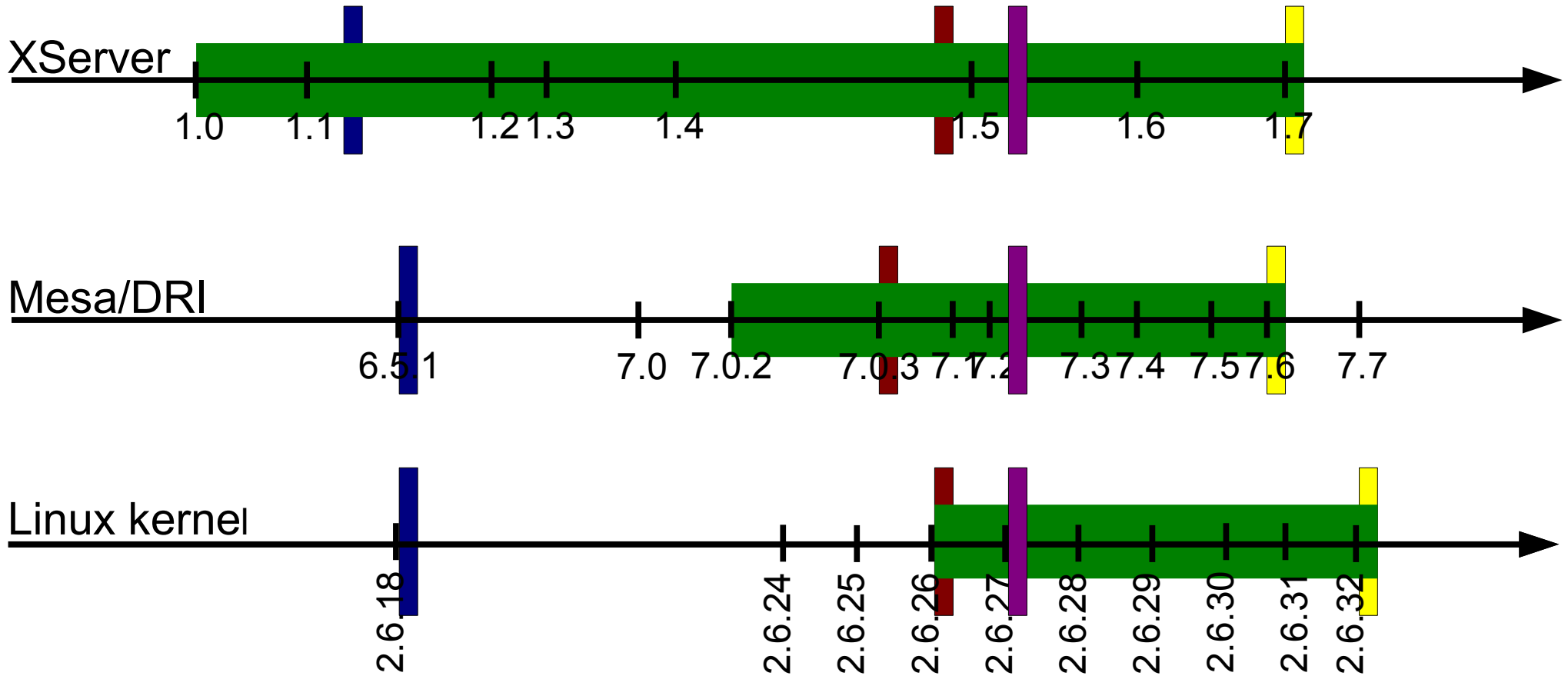
■ Debian oldstable (etch)   ■ Debian stable (lenny)   ■ Debian testing (squeeze)

■ OpenSUSE 11.1

Unified building – X driver

- Needs xf86 SDK.

- Autotooled since modular X.

- Familiar process by now ;)

Unified building – linux/drm

- Needs linux kbuild and headers packages.
- Autotools integrated Kbuild.
- Easy!

Unified building – Mesa/DRI

- Needs especially prepared mesa tree. :(
    - ./configure
    - cd src/mesa/
    - make libmesa.a
- Autotools integration:

  ./configure --with-mesa-dir=<DIR>

- Icky, but not hard.

TODO

- Everyone needs to start doing unified trees!
- Care needs to be taken in APIs...
- … which will happen naturally.

TODO: kernel/drm

- Just organisation/repository changes.
- Longer term: Segregate HW init, modesetting, memory management and drm parts.

TODO: libdrm

- Move out driver specific parts NOW!

- Driver headers and register definitions are not libc headers!

- Again, modesetting, memory management and standard libdrm are separate. Split there!

TODO: Mesa

- Modularize!

- Provide shared libraries: libmesabase libmesadri, libmesagallium, libmesadricommon

- Formalize APIs for these libraries.

- Add pkgconfig and packaging.

Questions?

```
                xyz_drv.so                                    xyz_dri.so

                    │                                              │
                    │        ┌─────────────────────────┐          │
                    ▼        │                          │          ▼
              Xorg/Xserver   │                          │      Mesa/DRI
                    │        │                          │          │
                    │        │                          │          │
                    ▼        ▼                          ▼          ▼
                  Libdrm  ◄─────────  libdrmxyz
                    │                      │
                    │                      │
                    ▼                      ▼
             ┌──────────────────┐      xyz.ko
             │     drm.ko  ◄────────────┘
             │       │          │
             │       ▼          │
             │   Linux kernel   │
             └──────────────────┘
```