



OpenGL in LibreOffice

- ▼ Markus Mohrhard (moggi)
- ▼ 2015-05-01

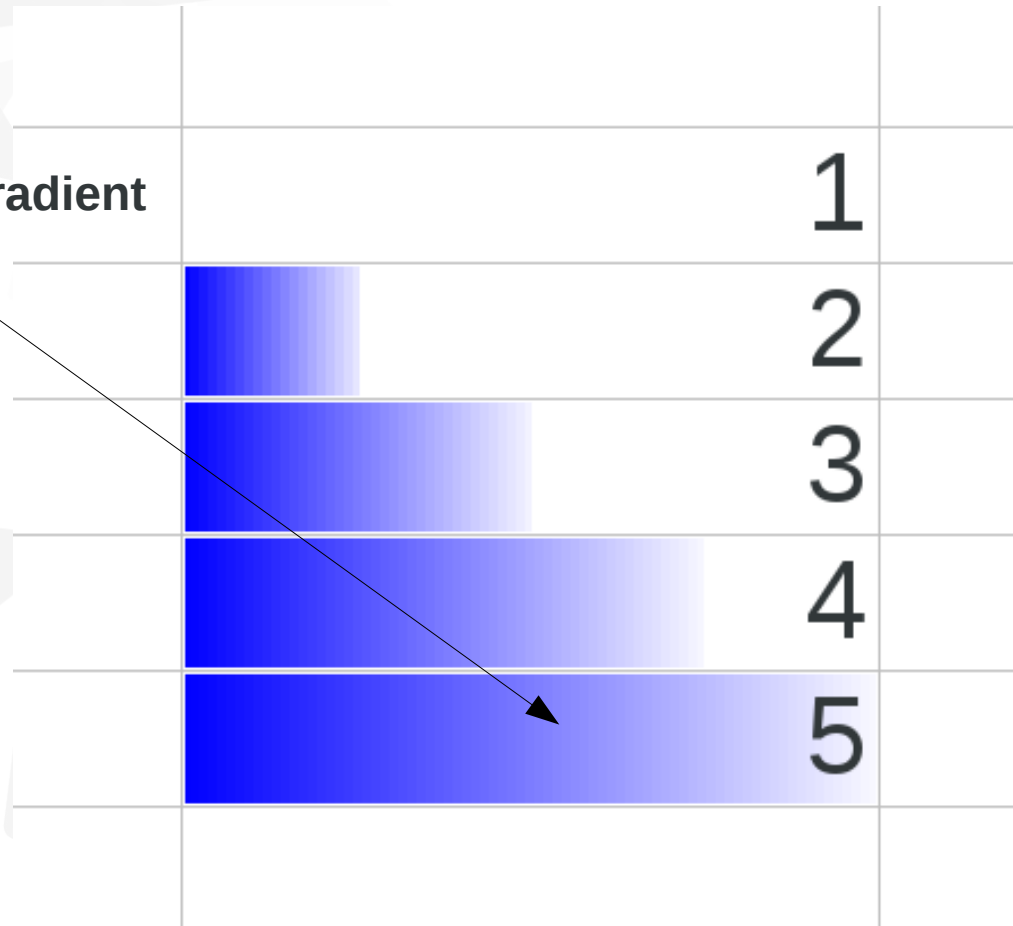
Topic

- ▼ Not talking about old OpenGL features
 - ▼ OpenGL Slide Transitions
 - ▼ OpenGL drawinglayer canvas
 - ▼ OpenGL charts
- ▼ Replacing whole rendering with OpenGL

Motivation

Rendering problems

Visible steps in gradient



Mobile



http://developer.android.com/images/brand/Android_Robot_200.png
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5554: Tablet2

DocumentLoader

He lay flat on the brown, pine-needled floor of the forest, his chin on his folded arms, and high overhead the wind blew in the tops of the pine trees. The mountainside sloped gently where he lay; but below it was steep and he could see the dark of the oiled road winding through the pass. There was a stream alongside the road and far down the pass he saw a mill beside the stream and the falling water of the dam, white in the summer sunlight.
"Is that the mill?" he asked.

RED GREEN BLUE YELLOW MAGENTA TURQUOISE

| Question | Year |
|---|------|
| <i>He lay flat on the brown, pine-needled floor of the forest, his chin on his folded arms, and high overhead the wind blew in the tops of the pine trees. The mountainside sloped gently where he lay; but below it was steep and he could see the dark of the oiled road winding through the pass. There was a stream alongside the road and far down the pass he saw a mill beside the stream and the falling water of the dam, white in the summer sunlight.</i> "Is that the mill?" he asked. | 1940 |

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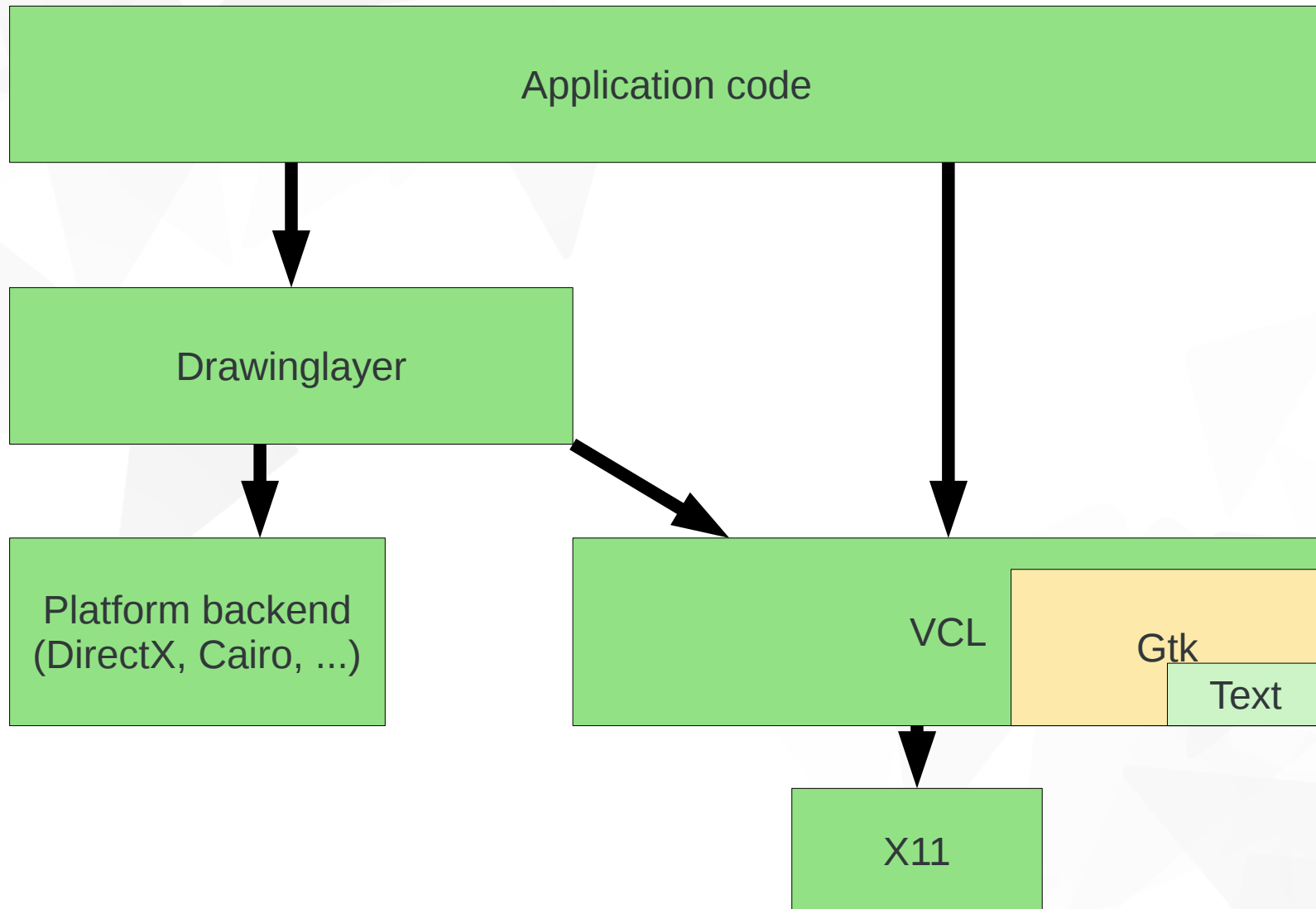
2:45 3G

Performance

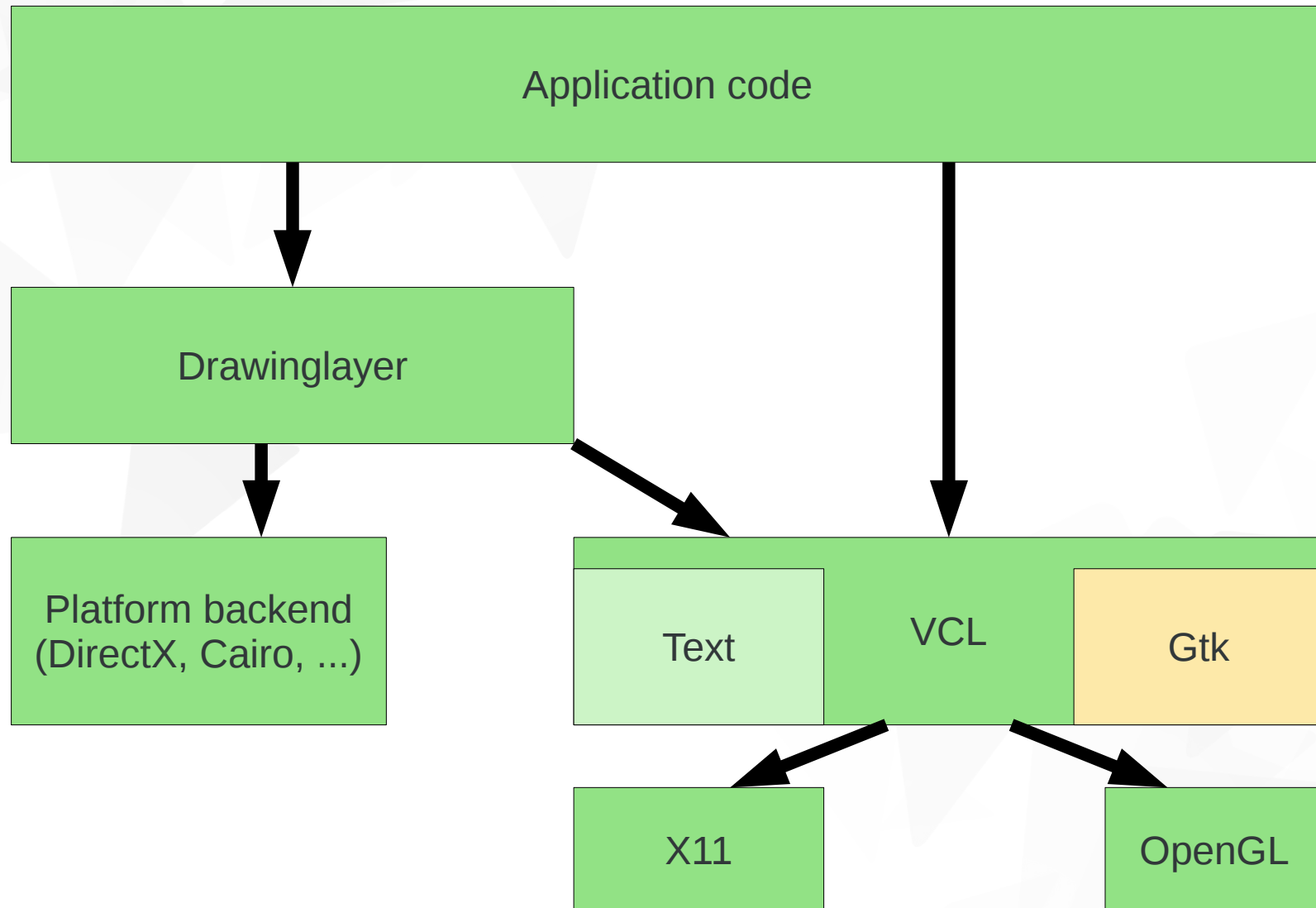


Technology

Old design (example based on gtk backend)



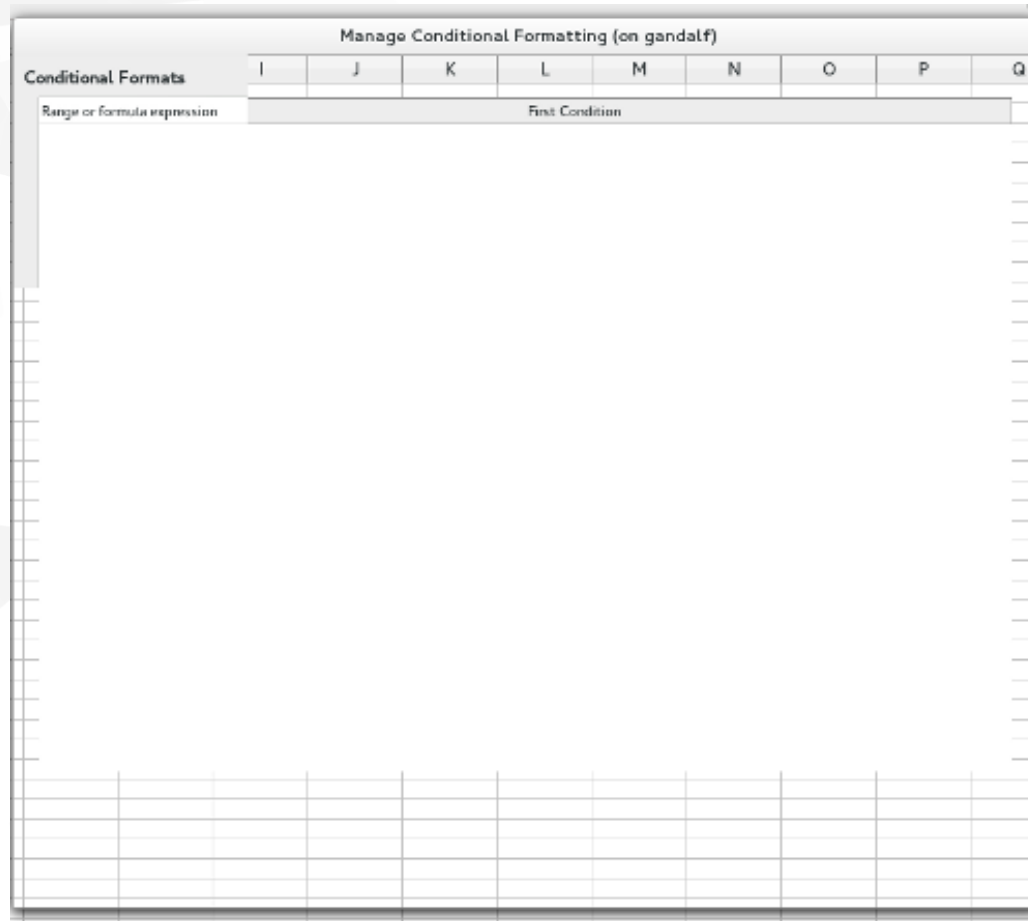
New design (example based on gtk backend)



Problems



Single buffered rendering



OpenGL drivers

```
moggi@venus:~/devel/libo/instdir/program> SAL_ENABLE_GL=1 ./soffice --calc  
warn:vcl.opengl:5959:1:vcl/opengl/x11/X11DeviceInfo.cxx:285: blocked driver version: my broken intel driver Mesa 9.0.2  
warn:vcl.opengl:5965:1:vcl/opengl/x11/X11DeviceInfo.cxx:285: blocked driver version: my broken intel driver Mesa 9.0.2  
warn:legacy.osl:5965:1:vcl/source/qdi/image.cxx:394: ImageAryData::Load: failed to load image 'cmd/lc iconsetformatdialog.pn
```

Graphics Output

- Use hardware acceleration
- Use anti-aliasing
- Use OpenGL for all rendering
- Force OpenGL even if blacklisted

Performance

```
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:85: OpenGLSalBitmap::Create with size: 32x32
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:163: OpenGLSalBitmap::AllocateUserData
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:155: Destroy OpenGLSalBitmap
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:53: ~OpenGLSalBitmap
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:155: Destroy OpenGLSalBitmap
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:53: ~OpenGLSalBitmap
info:vcl.opengl:6244:1:vcl/opengl/gdiimpl.cxx:1174: ::drawRect
info:vcl.opengl:6244:1:vcl/opengl/texture.cxx:48: OpenGLTexture 1 1x1 allocate
info:vcl.opengl:6244:1:vcl/opengl/framebuffer.cxx:25: Created framebuffer 1
info:vcl.opengl:6244:1:vcl/opengl/framebuffer.cxx:36: Binding framebuffer 1
info:vcl.opengl:6244:1:vcl/opengl/framebuffer.cxx:62: Attaching texture 1 to framebuffer 1
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:155: Destroy OpenGLSalBitmap
info:vcl.opengl:6244:1:vcl/opengl/salbmp.cxx:85: OpenGLSalBitmap::Create with size: 32x32
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```


OpenGL context lifecycle

- ▼ Reuse of context for performance reasons
- ▼ Use after free resulting in corruptions in driver
- ▼ Slowly fixing them
 - ▼ mostly visible on Windows
- ▼ Multithreading is a nightmare
 - ▼ Global state

Demo

Credits

- ▼ AMD
- ▼ Collabora
 - ▼ Louis-Francis Ratté-Boulianne
 - ▼ Jan Holesovsky
 - ▼ Michael Meeks
 - ▼ Luboš Luňák
 - ▼ Markus Mohrhard
- ▼ LibreOffice community



Thank you ...

- ▼ ... listening!
- ▼ ... for supporting LibreOffice!



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