LOOK!
IT’S LIBREOFFICE ON KDE PLASMA

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LOOK WHO'S TALKING

> LibreOffice squirrel @CIB
> GSoC mentor
> Qt widget charmer
> WITch, feminist
„PORTING“ KDE4 VCL PLUGIN TO KF5

1. VCL PLUGIN ARCHITECTURE ON LINUX
2. WHY PORT WRITE FROM SCRATCH?
3. CHALLENGES
4. FILEPICKER
5. NEW STUFF
VCL PLUGIN ARCHITECTURE ON LINUX
VCL? VCL!

- Visual Component Library
- Visual Class Libraries
- Very Complete Library
- Vastly Clueless Library
- Very Confused Library
PLATFORM-DEPENDENT BITS

• Widget look’n’feel
  - Windows and mac OS X
  - gtk and gtk3
  - generic X11 („Windows 95‟)
  - kde4, qt5 and kf5

• Menus

• File/folder picker dialogs

• Printing
SALINSTANCE, SALFRAMES

> SalInstance
- every platform/vcl plugin implements one
- create and destroy: SalFrames, SalPrinters, SalVirtualDevices

> SalFrame
- system window (main window, dialog etc.)
- [undocked] floating window
- tooltip
- non-native [context] menu
- listbox | toolbox dropdown
CreateFrame (main window)

CreateFrame (dialog, dropdown)

Sally Instance

CreateFilePicker
SALFRAME, SALGRAPHICS

> SalFrame
  - every platform/vcl plugin implements one

> SalGraphics
  - enables drawing to SalFrame
  - APIs such as drawRect, drawLine
  - drawNativeControl (draws widgets!)
IN A NUTSHELL

SalInstance → SalFrame → Acquires, releases → SalGraphics

creates

initializes

SalData
WHY PORT WRITE FROM SCRATCH?
KDE4 VCL PLUGIN HAS AGED

> KDE4 becoming legacy on most Linux distributions
> Thin layer around X11/XLib VCL plugin
> Only emulates KDE look'n'feel
  - no native widgets, QPainter with QStyle* to render widgets
  - combined into QPixmap
  - copied directly into X11 window
    (X11SalGraphics::CopyScreenArea)
  - slow painting, no image caching
„NATIVE” LOOK’N’FEEL WITH X11

X11 Window

QPainter + QStyleOption

QPixmap

QImage

X11SalGraphic::CopyScreenArea

“Paste”

OK
KDE4 VCL PLUGIN HAS AGED EVEN MORE

> XLib way of processing the events (QApplication::x11ProcessEvent)

> No modal native dialogs
  - as LibO Widgets are not wrapped in QWidgets

> No Wayland support
DIRECT PORT TO KF5 NOT POSSIBLE

> No way to access internal X11 pixmap anymore
> Similarly, no more X11 event filtering and processing
CHALLENGES
CHALLENGE: X11-LESS WINDOWS

> Replace X11 windows with native QWindows, QWidgets
  - 1 SalFrame ↔ 1 QWidget (QMainWindow respectively)

> Side effect: natively modal dialogs now possible
  - pop-up dialogs centered over its parent, grey background overlay
  - Qt API: setModality, setTransientParent
CHALLENGE: X11-LESS PAINTING

▶ Variant 1 (plain Qt5): clean-room implementation of QPaintBase-based SalGraphics
  - 2nd rendering path on Linux (aside headless)

▶ Variant 2 (KF5): integrate with headless SalGraphic
  - custom QWidget with cairo canvas inside
  - QPainter (+QStyle[Option]) to paint widget bitmaps and yield QImage
  - Raw bitmap extracted from QImage and “pasted” to cairo canvas (BitBLT of a kind)
X11-LESS PAINTING

QPainter + QStyleOption

QWindow with cairo canvas

Convert to raw bitmap and “paste” (cairo operator)

QImage

OK
CHALLENGE: X11-LESS PROCESSING OF EVENTS

- SalFrames are now QWidgets
- Side effect: they receive Qt events
- So we can map them to SalEvents (in re-implemented event handlers)
- Additional QAbstractEventDispatcher for non-user driven events
FILEPICKER
HOW IT WORKS

> „Agnostic“ C++ core code (e.g. print to file)
  > „Open a file dialog“ (letting user to pick file to print to)
> SalInstance (UI manager)
  > „Okay, opening a file dialog“
  > ::CreateFilePicker, ::CreateFolderPicker respectively
> KDE5FilePicker
  > „I’m implementing XFilePicker interface and providing the necessary functions“
HOW IT WORKS II

Print to file: Open a file picker

Sally Instance

Joe KF5 Picker

I implement XFilePicker and XFolderPicker interfaces

Print to file:
Open a file picker
WHY SO COMPLICATED?

> Why do we need all those interfaces?
  - get/setDisplayDirectory
  - get/setCurrentFilter
  - enableControl
  - get/setLabel etc.

> Because of custom LibO functionality
  - encrypt with password/GPG key
  - edit filter settings
  - enable/disable custom controls as needed
(SMALLER) CHALLENGE: MIGRATE GTK3_KDE5 FSELECT TO PLAIN KF5

> Original work by Milian Wolff (KDAB)
> Ships with LibreOffice 6.1
> Gtk3 UI + Plasma filepicker as a separate binary
> Communicating over stdin/stdout
> Most of XFilePicker interface funcs implemented
> Kill I/O with fire and open KFileDialog directly
NEW STUFF
NATIVE FOCUS RECTANGLES FOR [RADIO]BUTTONS AND CHECKBOXES

Before:

**Menu**
- Icons in menus:
  - Automatic
- Shortcuts in context menus:
  - Automatic

**Font Lists**
- Show preview of fonts

After:

**Menu**
- Icons in menus:
  - Automatic
- Shortcuts in context menus:
  - Automatic

**Font Lists**
- Show preview of fonts
NATIVE MENUS
(INCL. GLOBAL MENU SUPPORT)
REAL FOLDER PICKER

Before:

After:
THE CODE

> In LibreOffice master
> Build with --enable-qt5 and --enable-kde5
> Not yet enabled for daily builds – needs baseline upgrade
> (tentatively) shipped with LibreOffice 6.2
  - First beta in November 2018
  - Released in February 2019
ANY QUESTIONS, COMMENTS, PRAISE, CRITICISM, OFFERS (OF BEER)?

THE ANSWER TO YOUR QUESTION IS...

NO

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THANK YOU!