



# LibreOfficeKit: Recent Developments

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Collabora  
Online



# Main idea of LibreOfficeKit: Share code!

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## LibreOffice has lots of functionality

- The idea is to bring this [LibreOffice Technology](#) to other use cases
- Filters, document layout, rendering of advanced structures, charts, document embedding, document generation, ...

## LibreOfficeKit

- Originally for document conversion
- Much improved & extended over the years
- Able to control a LibreOffice behind the scenes

## Collabora Online

- Heavy user of LibreOfficeKit & the [LibreOffice Technology](#)
- Uses it for the document import, export, modification, rendering and collaboration



# LibreOfficeKit API

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## **C and C++, in-process**

- Means easy debugging!

## **Conversion operations**

- `loadDocument()`, `saveAs()`

## **Rendering-related**

- `paintTile()`, `setPart()`, `getDocumentSize()`, ...

## **Operations on the document**

- `postKeyEvent()`, `postMouseEvent()`, `postUnoCommand()`, `paste()`, `setTextSelection()`, ...



# LibreOfficeKit callbacks

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**For letting clients know about events that happen in LibreOffice**

- Textual workloads, in some cases JSON

## **Rendering-related**

- Tiles must be invalidated, cursor position / size has changed, graphics selection has changed, document size changed

## **Operations-related**

- Search not found, search result, command state has changed, command result, etc.



# Example application: gktiledviewer

```
#include <LibreOfficeKit/LibreOfficeKitGtk.h>
// Only include once where lok_init is called:
#include <LibreOfficeKit/LibreOfficeKitInit.h>

...

// Manage your own LOK instance
LibreOfficeKit* pOffice = lok_init( "path/to/LO" );
LOKDocView* pDocView = lok_docview_new( pOffice );

// add to your gtk+ window/whatever here.

lok_docview_open_document( pDocView, "path/to/document" );

// Some convenience methods
lok_docview_set_zoom( pDocView, 2.0 );
lok_docview_set_part( pDocView, 2 ); // Select slide or sheet.

// read LibreOfficeKitGtk.h for the full API
```





# gtktilviewer

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## Used mostly as a LibreOfficeKit debugging tool

- Built directly as part of the LibreOffice code when `--enable-gtk3` is given to LibreOffice's `./configure`
- Normal case:  
`bin/run gtktilviewer --lo-path=`pwd`/instdir/program document.odt`
- Run in debugger:  
`LO_TRACE='gdb --tui --args' bin/run gtktilviewer --lo-path=`pwd`/instdir/program document.odt`
- Run with valgrind:  
`LO_TRACE='valgrind --tool=callgrind --simulate-cache=yes --dump-instr=yes' bin/run gtktilviewer --lo-path=`pwd`/instdir/program document.odt`





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# Where is LibreOfficeKit used?



# Document conversion

**lloconv** - <https://gitlab.com/ojwb/lloconv>

- By Olly Betts
- ```
const char * lo_path = get_lo_path();  
llo = lok_cpp_init(lo_path);
```

...

```
Document * lodoc = llo->documentLoad(input_url.c_str(), options);
```

...

```
lodoc->saveAs(output_url.c_str(), format, options);
```





# LibreOffice Android Viewer

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**Uses a Java wrapper of the LibreOfficeKit functionality**

- Directly in the LibreOffice core
- Tiles output to the screen reused from Fennec
- Currently maintained by Michael Weghorn



# Collabora Online use of LibreOfficeKit

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## **LibreOffice core re-purposed to serve the tiles, events, and react on user's input**

- Used to access internals of the LibreOffice core
- Callbacks for the events that come from the core – triggered by timers or users actions

## **In worker processes**

- One process per document
- Multiple collaborators in a document – access this one process
- The document is not painted as a huge area, but only as a set of 256x256 pixel tiles

## **Lots of de-duplication of messages needed**

- Callbacks coming from the core can come at a high speed
- And the newer messages actually may make the older ones invalid (but not always)





# Collabora Office Android and iOS apps

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## Reuse large part of the Collabora Online

- But instead of a browser, they use the native WebViews on the phone/tablet
- The C++ bits stripped down
  - LibreOffice core – compiled into a static library
  - LibreOfficeKit to access it
  - Coolwsd – http(s) serving removed, various bits to pass the tiles directly
- Platform-native wrapper to manage the lifecycle



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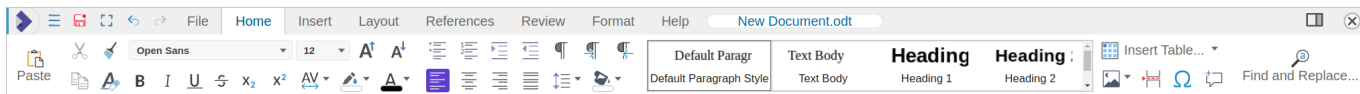
# Recent improvements



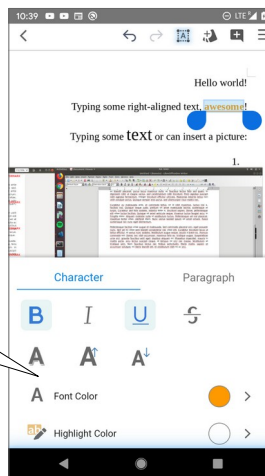
# Rendering dialogs client-side

## Long, ongoing effort

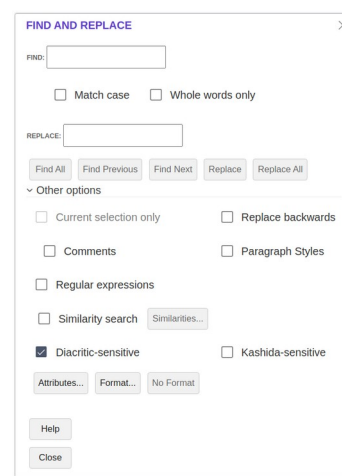
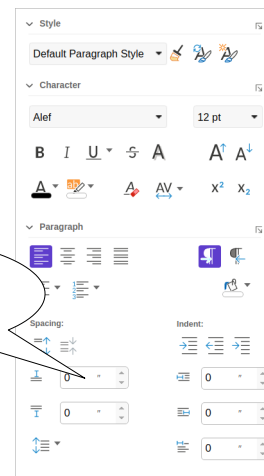
- The LibreOffice dialogs are described in JSON
- And then rendered client-side, in eg. webbrowser (or Andoid or iOS app)
- Started as a solution for sidebar on mobile phones, notebookbar followed, and now it is possible to render the full sidebar or dialogs even in desktop browsers
- Szymon Kłos (Collabora)



This is the sidebar!



This is the sidebar, too!

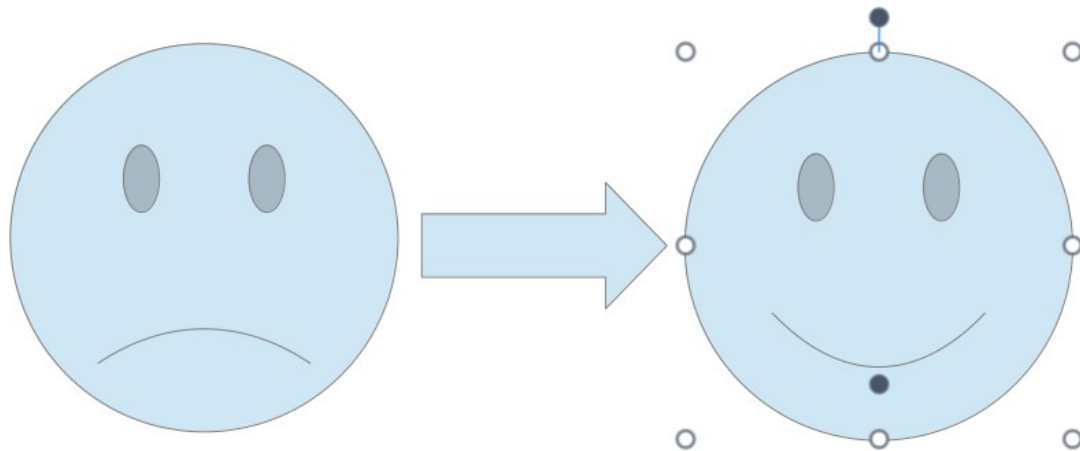




# Support for better shape manipulation

## API to access the control points directly

- Which enables improved manipulation with shapes
- Allows line endpoints to be moved, control points, glue points
- And render them client-side
- Mert Tumer (Collabora)

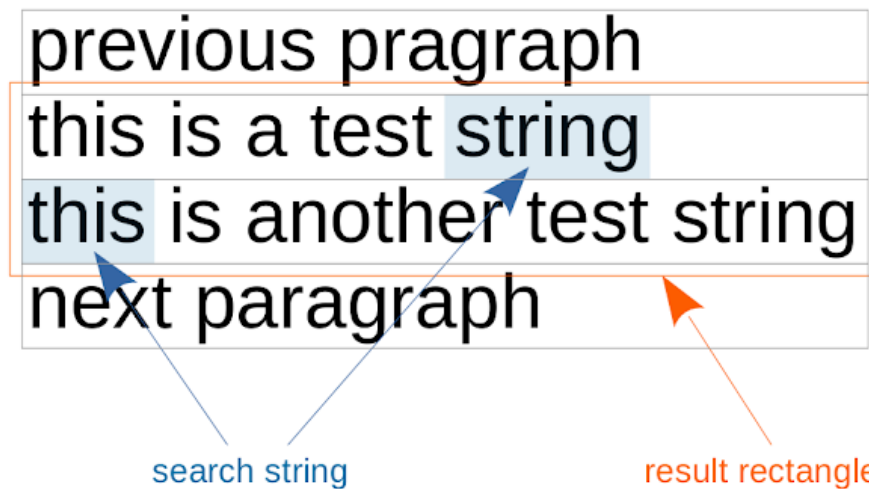




# LOK API to render search result

## Search result into a bitmap

- Combined the SearchResultLocator to get the location inside the document of the search result (a series of rectangles) and the existing LOKit paintTile API
- Possible to integrate into search engine results
- Tomaž Vajngerl (Collabora)





# LOK API to lock down some functionality

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## Based on .uno commands

- Sometimes not all the functionality of LibreOffice should be available
- This adds the possibility to disable various menu, toolbar or sidebar entries
- Pranam Lashkari (Collabora)

## Macro security level support

- Henry Castro (Collabora)





# Android Viewer, PDF export

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## **Jump to a cell cursor in LibreOffice Android Viewer**

- Fires signal to jump to a cell cursor
- Ilhan Yesil (Unaffiliated)

## **Transparent tiles in LibreOffice Android Viewer**

- Unified the rendering of tiles to use the same approach as Collabora Office for Android
- Michael Weghorn (Unaffiliated)

## **Possibility to specify the PDF export version**

- When saving as (converting to) PDF
- Gabriel Masei (1&1)



# Document background callback

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## Currently used in Calc

- To be able to send the tiles as transparent, and the document background is drawn client-side
- Combined with painting the cell grid client-side too
- Saves lost of invalidation & PNG compression
- Dennis Francis (Collabora)



# Thank you!



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