Collaborative editing
Using LibreOfficeKit
By Miklos Vajna
Senior Software Engineer at Collabora Productivity
2016-09-08
About Miklos

- From Hungary
  - More blurb: http://vmiklos.hu/
- Google Summer of Code 2010/2011
  - Rewrite of the Writer RTF import/export
- Writer developer since Feb 2012
- Contractor at Collabora since Sept 2013
Collaborative editing for LibreOffice Online
Tiled rendering

- Initially for iOS/Android
- Idea: render many 256x256px tiles
  - Instead of using UNO to render a single huge bitmap
  - Used by Firefox for Android successfully

Purpose of This Document

This document shows various elements where the cursor needs to work, together with other features described in the tender document. 2nd paragraph; just to show selection over several paragraphs. 

And underlined. But also increased font size, that needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer.
Tiled editing

• If we have a viewer, why not allow editing, too?

• Needs input handling and lifecycle management for tiles

• Firefox renders webpages
  • Javascript → they need to update rendered webpages as well

Purpose of This Document
This document shows various elements where the cursor needs to behave correctly to work, together with other features described in the tender document.

2nd paragraph: just to show selection over several paragraphs. Various properties and underlined. But also increased font size, that might be interesting. But this paragraph needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer.

Right-aligned paragraph... This paragraph needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer. This paragraph needs to be a bit longer.

Text is not everything
Textbox used to work too but opted taking themselves one behaving unclear.
Conflict handling

- Do a best-effort resolution and notify the user immediately
- This was a suboptimal result can be fixed quickly & easily
- Example: cursors inside a word

LibreOffice for Android: Evaluation

Document

Purpose of This Document

The document shows various elements where the cursor needs to behave correctly, selections have &, together with other features described in the tender document.
Text cursors

- View the colored cursor of others:
  - Visibility, position, size
- Used in:
  - Writer text, editengine text (Calc cells, shape text)
- Same overlay as the one used for the blinking / black cursor
Text selections

- Text selection is a rectangle list
- Color is always the same as the matching cursor
- Used next to text cursors everywhere
- Also implemented:
  - Instant update of shape text in all views
  - Lock indicator

LibreOffice for Android: Evaluation Document

His document shows various elements where the cursor needs to behave correctly, selections have been...
Graphic selection

- Graphic selection’s:
  - Visibility, position, size
- Used for shapes everywhere

This shape has some text inside, it is supposed to be selectable too.

This text inside, is selectable too.
Cell cursors

- Cell cursor’s:
  - Visibility
  - Position
  - Size

- Used in Calc when:
  - Not selecting a shape
  - Not editing cell text
Document repair

- Tag all the undo actions with the view ID
- Present the undo/redo stack as a table
- Can go back & forth in time

<table>
<thead>
<tr>
<th>Type</th>
<th>Index</th>
<th>Comment</th>
<th>View ID</th>
<th>Timestamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>.uno:Redo</td>
<td>1</td>
<td>Typing: 'zzz'</td>
<td>1</td>
<td>2016-09-06T00:19:15,0877717402</td>
</tr>
<tr>
<td>.uno:Redo</td>
<td>0</td>
<td>Typing: 'aaa'</td>
<td>0</td>
<td>2016-09-06T00:19:13,023090678</td>
</tr>
<tr>
<td>.uno:Undo</td>
<td>0</td>
<td>Typing: '999'</td>
<td>1</td>
<td>2016-09-06T00:19:11,018037789</td>
</tr>
<tr>
<td>.uno:Undo</td>
<td>1</td>
<td>Typing: '111'</td>
<td>0</td>
<td>2016-09-06T00:19:04,848067153</td>
</tr>
</tbody>
</table>
Track changes

- Per-view author name is handled
- Equivalent of track changes dialog:
  - Insert items with correct name
  - List items
  - Accept / reject items
  - Keep the list up to date
How is this implemented?
Multiple windows

- Map one user to one window
  - Window → New window on the desktop
- Lots of conflict resolution handled this way out of the box
  - Had to fix e.g. repaint on undo, though
- In Writer and Impress windows are already mostly independent
View management

- New `lok::Document` member functions:
  - `createView()`, `destroyView()`, `setView()`, `getView()`, `getView()`
  - Call `setView()` before every other existing member function:
    - `postKeyEvent()`, `postMouseEvent()`, etc.
View callback

- Tiled editing introduced a document-specific callback
- Now this callback is moved to the view (SfxViewShell)
- Cursor moves → one view is notified
- Insert slide → all views are notified
- Fully backwards compatible with the previous single-view API
Document repair: undo tagging

- Tag all the undo items with the view shell ID:
  - Writer, Calc, Impress, draw shapes, editengine
- Then we automatically get a nice changelog of who did what / who is responsible for what
- Work in progress: limiting – let one user undo only her changes, not others’
Track changes

- `getCommandValues(.uno:AcceptTracked Changes)` for Writer and Calc
- `initializeForRendering()` sets the per-view author name
  - Insert comment / redline picks that up (has priority over value from configmgr)
- Annotate insert, modify and accept/reject code with callbacks: `LOK_CALLBACK_CALLBACK_REDLINE_TABLE_*`
Testing

- Manual: gtktiledviewer
- Automated:
  - CppunitTest_desktop_lib
  - CppunitTest_sw_tiledrendering
  - CppunitTest_sc_tiledrendering
  - CppunitTest_sd_tiledrendering
  - 95 test cases, 400 asserts in core.git so far
Summary

• LibreOfficeKit now provides real-time collaborative editing
  • Will be available in LibreOffice 5.3
  • LibreOffice Online uses this
  • See also *LibreOffice Online Deep Dive* and *LibreOffice OnLine and ownCloud/Nextcloud* on Friday

• Thanks for listening! :-)  
• Slides: [http://vmiklos.hu/odp](http://vmiklos.hu/odp)