

LibreOffice

Architecture, accessibility and QA

Jacobo Aragunde Pérez

blogs.igalia.com/jaragunde

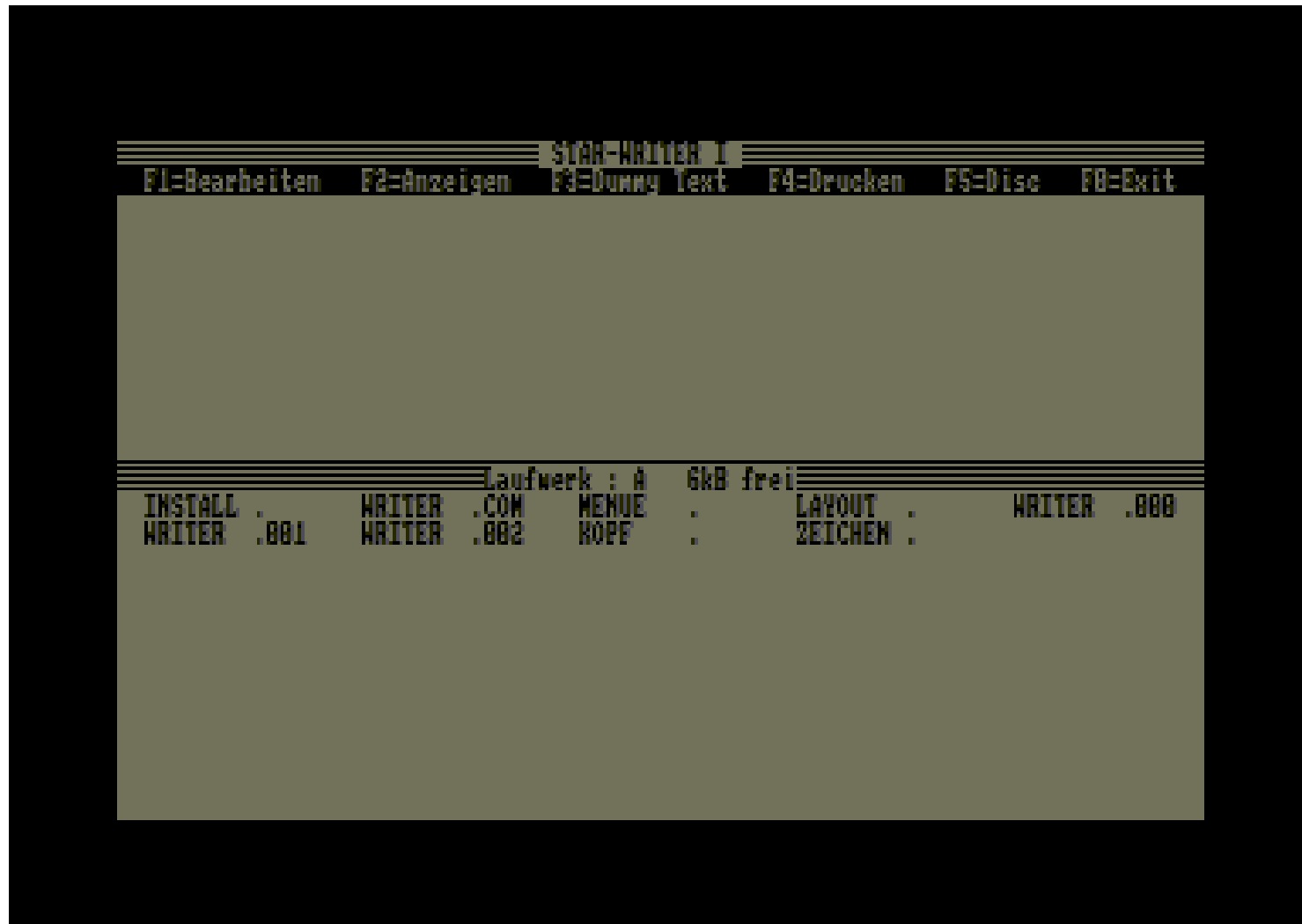


Project history

Some history

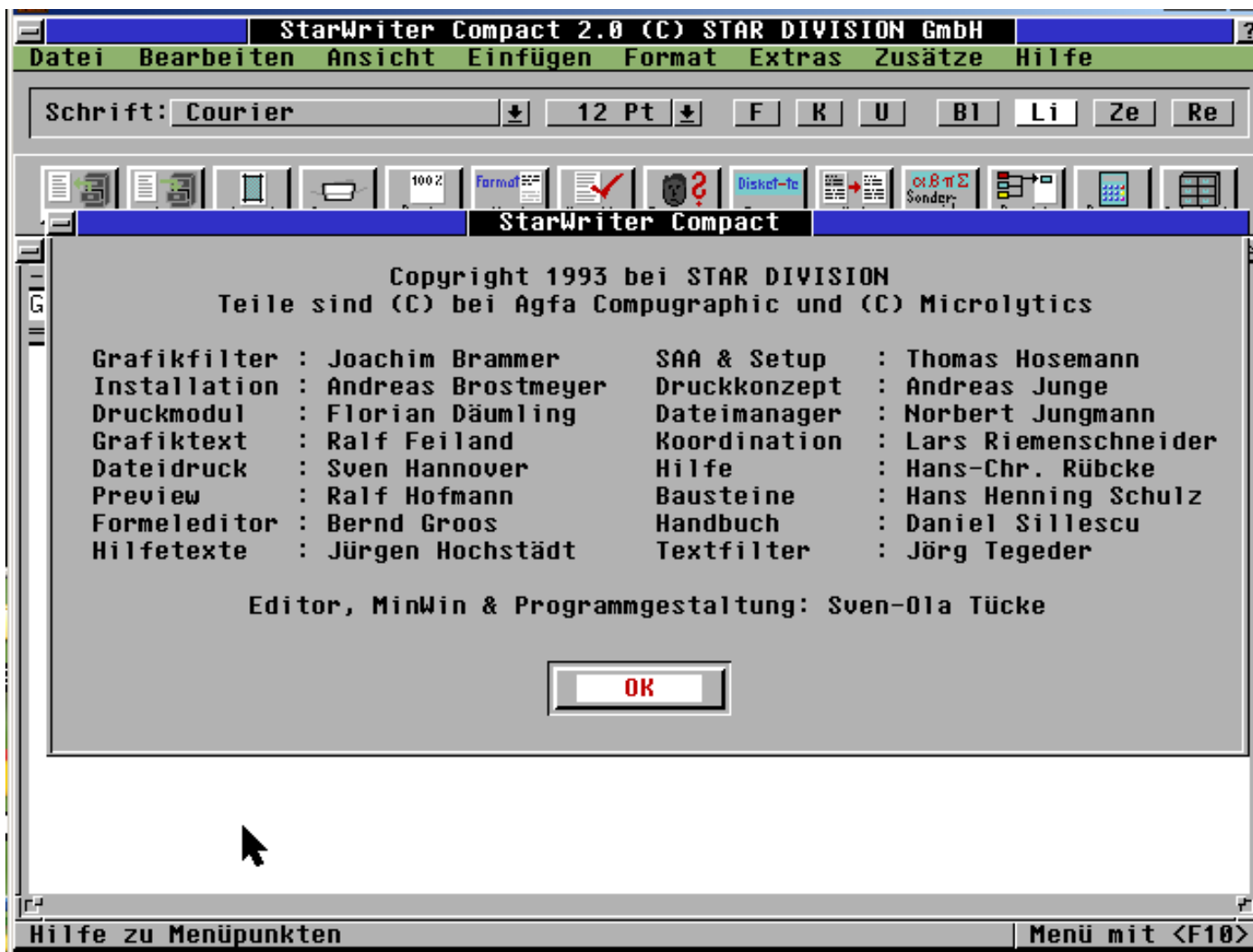
- 1985: StarWriter for Z80 micros
- 1986: StarDivision founded, StarOffice
- 1999: Sun Microsystems acquires StarDivision

StarWriter 1.0, 1986



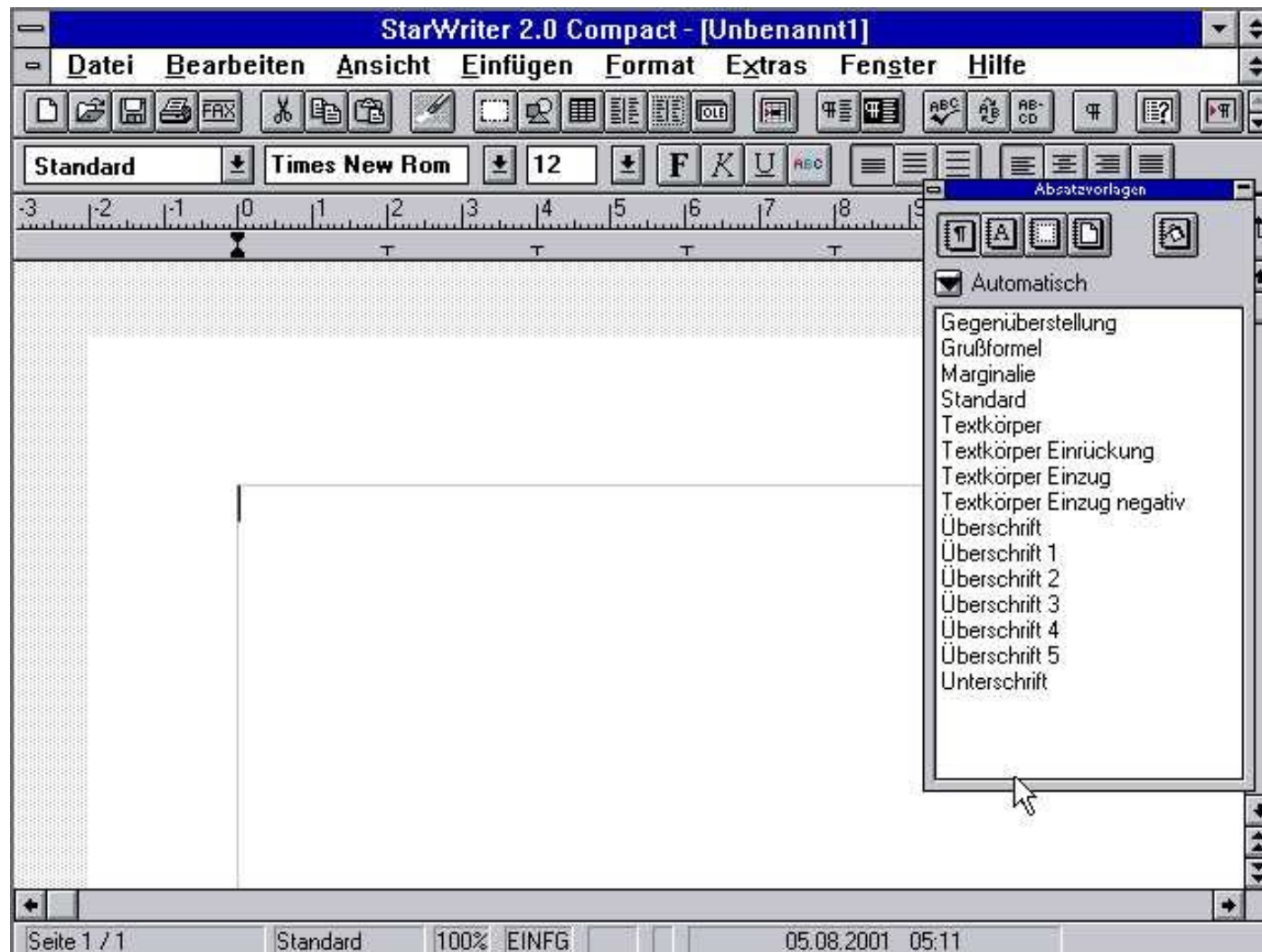
(source)

StarOffice 2.0, 1994



(source)

StarOffice 2.0, 1994



(source)

StarOffice 5.2, 2000

StarOffice 5.2 - [kupfer.sdw]

File Edit View Insert Format Tools Window Help

file:///home/warmada/My-Data/Pongkor/soff

Standard Times 12

Kupfer

Erzminerale

Chalkopyrit	CuFeS_2	34,5% Cu	D=4,2-4,3
Chalkosin	Cu_2S	80	5,7-5,8
Enargit	Cu_3AsS_4	48	4,4
Digenit	Cu_5S_8	78	5,7-5,8
Covellin	Cu_2S	66	4,7
Cuprit	Cu_2O	89	6,2
Malachit	$\text{Cu}_2(\text{OH})_2\text{CO}_3$	72	4

- Bauwürdig sind kleinere **Kupferlagerstätten** bei Gehalten von 3-5% im Erz, während sehr große. Im Tagbau gewinnbare Erzkörper ab 0,5%, bei Vorliegen weitere Metalle (Mo, Au, etc.) sogar ab 0,3 abgebaut werden. Sulfidische Kupfererze werden in der Regel durch Flotation zu Konzentraten mit 30 bis 60% Cu angereichert; diese werden durch metallurgische und elektrochemische Methoden zum **Kathodenkupfer** verarbeitet.
- Die Verwendung von Kupfer ist durch die hohe Leitfähigkeit des Metalles für Wärme und Elektrizität geprägt, so dass über 50% des Verbrauches diverse Produkte der Elektroindustrie betreffen. Weiter findet das Metall und seine Legierungen (Bronzen: Cu+Sn; Messing; Cu+Zn) durch günstige mechanische Eigenschaften sowie Verwitterungsbeständigkeit eine breite Anwendung in der Bauindustrie, im Maschinenbau und im Fahrzeugbau.
-

Page 1 / 1 Standard 111% INSRT STD HYP

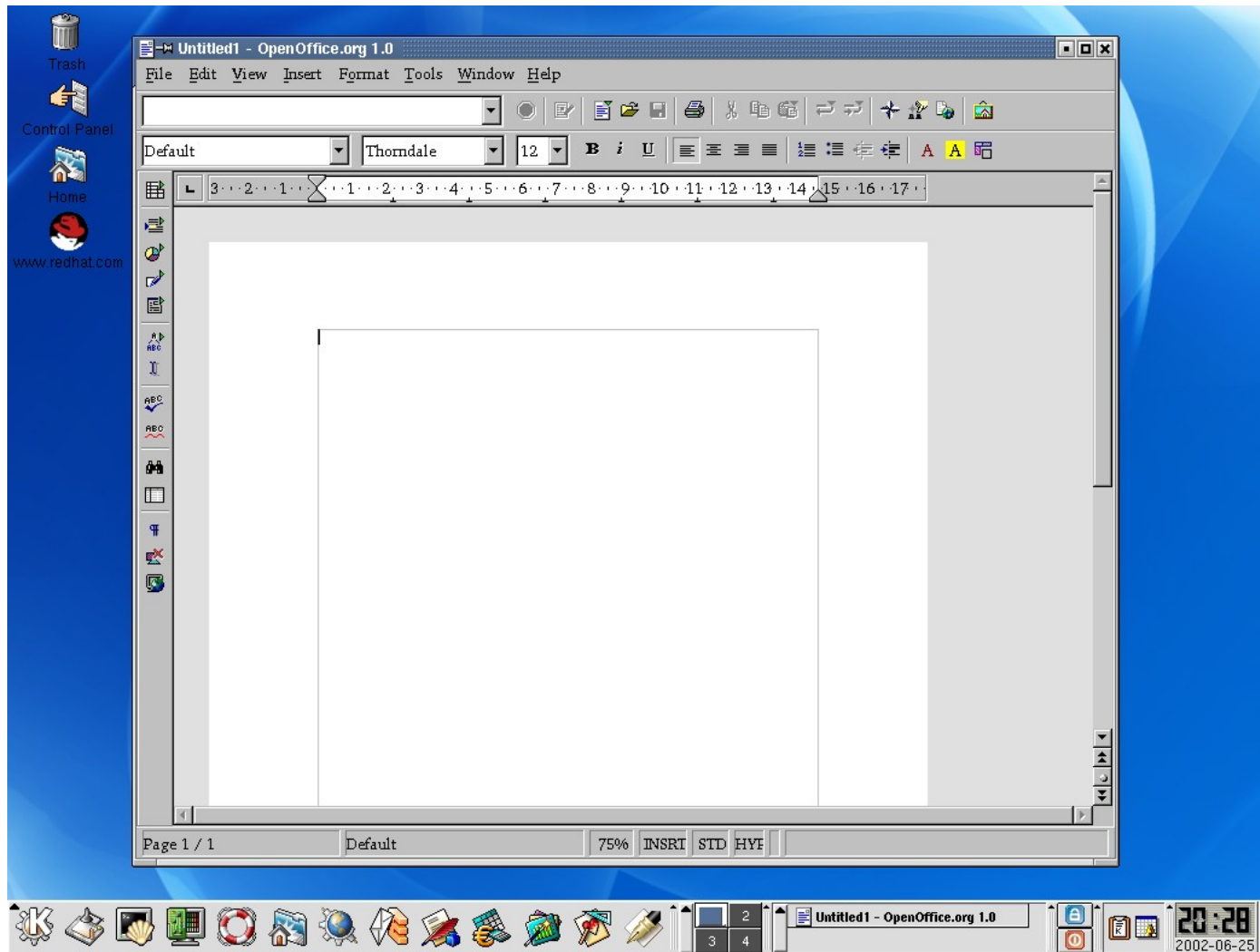
Start kupfer.sdw 22:37

(source)

Some history

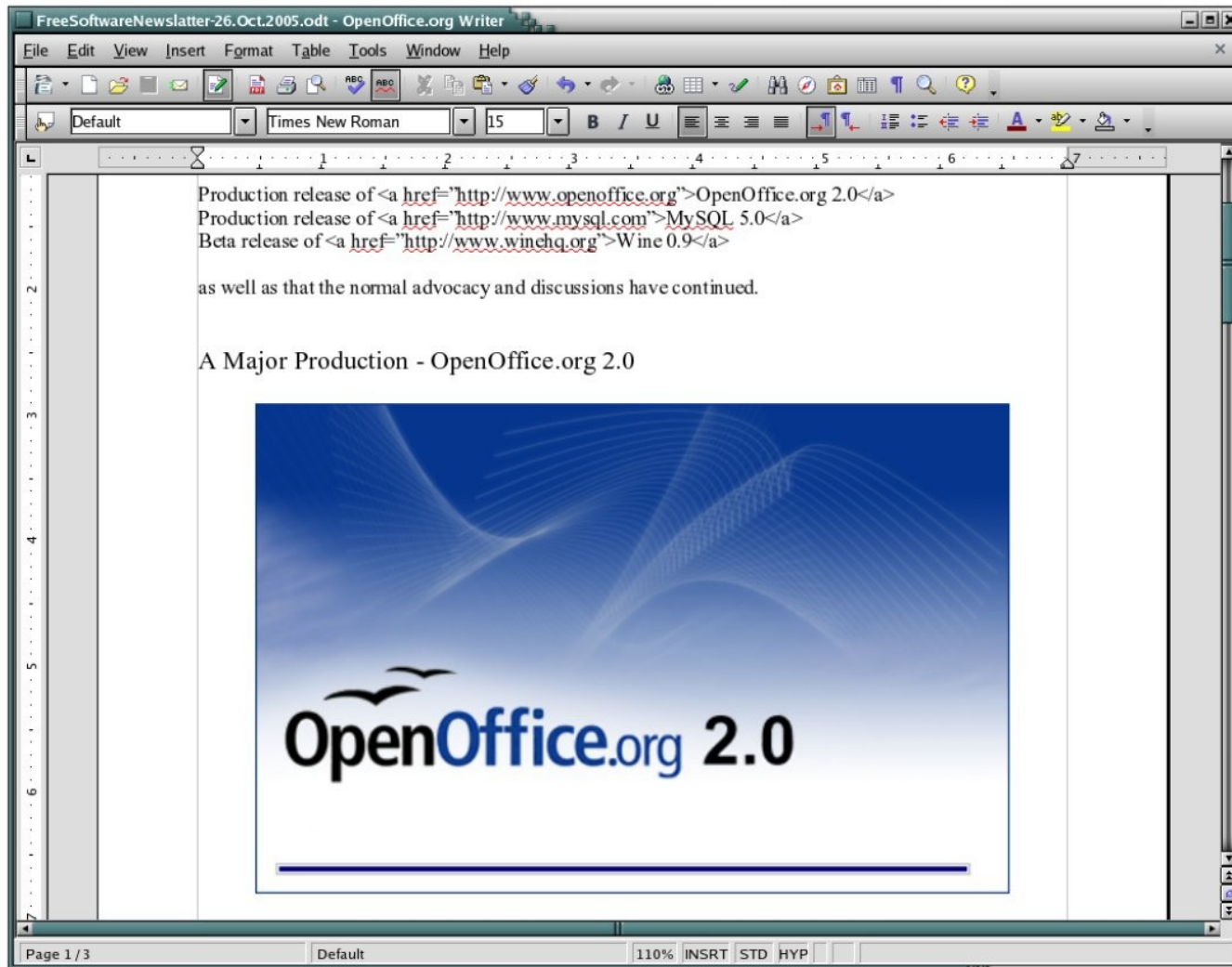
- 2000: OpenOffice becomes Free Software
- 2002: OpenOffice 1.0
- 2005: OASIS standard, OpenOffice 2.0

OpenOffice.org 1.0, 2002



(source)

OpenOffice.org 2.0, 2005

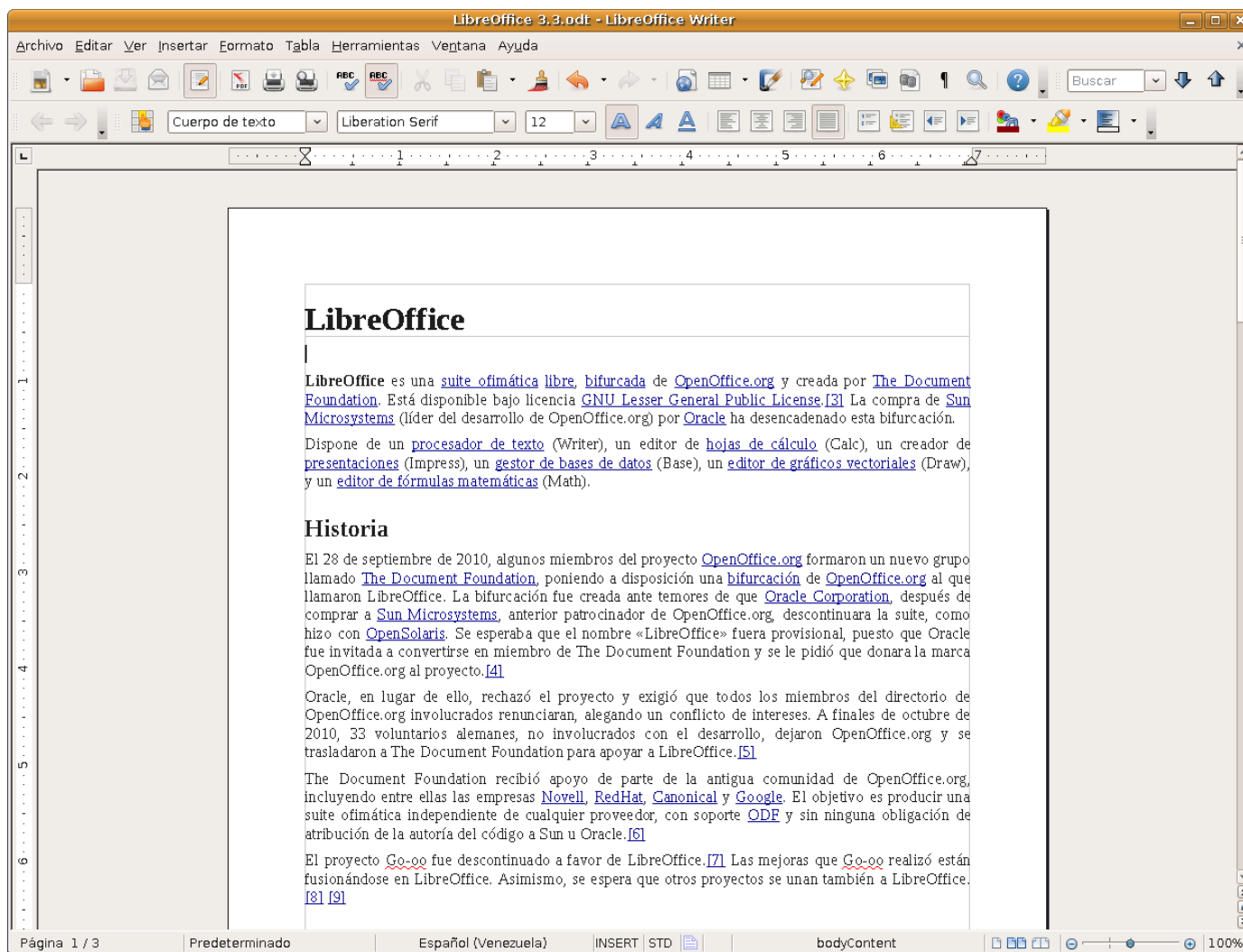


(source)

Some history

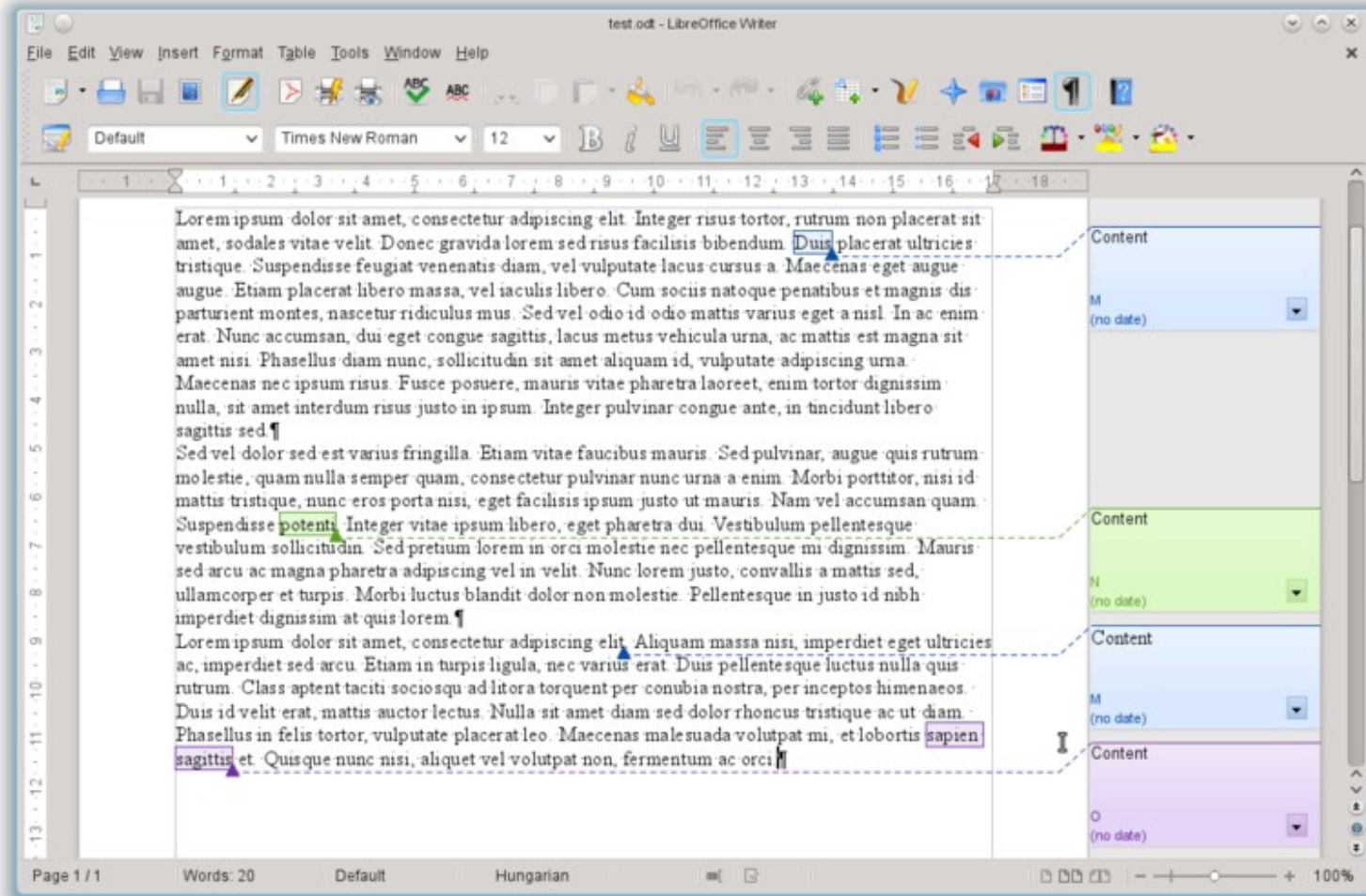
- 2010: Oracle acquires Sun
- 2010: LibreOffice and The Document Foundation
- 2011: Apache OpenOffice

LibreOffice 3.3, 2010



(source)

LibreOffice 4.x, 2013-15



(source)

LibreOffice 5.x, 2015-17

tdf-migrationwhitepaper1.pdf - LibreOffice Writer

File Edit View Insert Format Styles Table Tools Window Help

Autore Liberation Se 12

LibreOffice
The Document Foundation

White Paper

Migrating to LibreOffice to promote Software and Document Freedom

LibreOffice is the leading Free Software personal productivity suite for MS Windows, MacOS X and GNU/Linux, offering six feature-rich applications for all document production and data processing needs: Writer for text, Calc for spreadsheets, Impress for presentations, Draw for drawings, Base for databases, and Math for mathematical annotations.

LibreOffice is designed to address any personal productivity need, whether the user is an individual or an organization. The software is deployed on millions of PCs, including those of the French government, many regions, provinces and cities all over Europe - including the city of Munich in Germany - and many other organizations like the hospital system of Copenhagen in Denmark.

LibreOffice adopts the ISO standard Open Document Format (ODF), recognized by governments and organizations worldwide - including NATO - and based on true open standards, as the default format for all office documents. ODF files can easily be recognized by the filename extension: .odt for texts, .ods for spreadsheets, .odp for

Page 1 of 8 | 3,462 words, 21,803 characters | Default Style | English (USA) | 120%

LibreOffice Online, 2016

basic-text.docx - Collabora Online - ownCloud - Mozilla Firefox

basic-text.docx - Col... x

collaboraoffice.com/cool

Collabora Online admin

File Edit Insert View Tables

Default Style Karla 11 B I U S T

Collabora Online (COOL)

Welcome

This is the demo of the **Collabora OnLine (COOL)**.

Collabora Online is the essential building block for your document service, architected and made in Collabora.

Documents are processed *remotely* and *delivered locally*, and you will be able to create, view, and edit over all famous office document formats in the browser, just like this docx!

datacloud
AWARDS 2016
Shortlisted for the
Cloud Technical Breakthrough Award

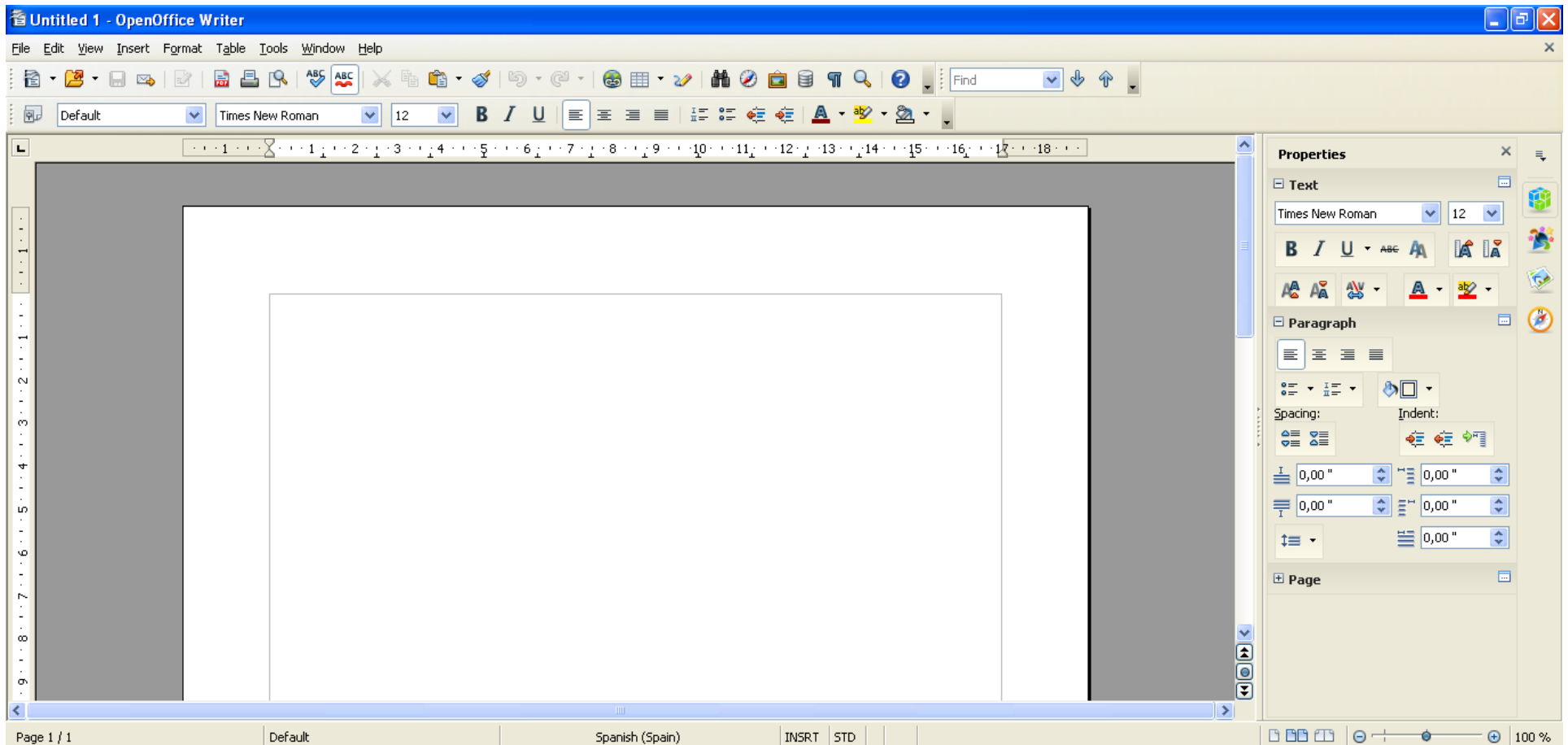
LibreOffice Online Customizable Integration Customizable User Interface

5x6

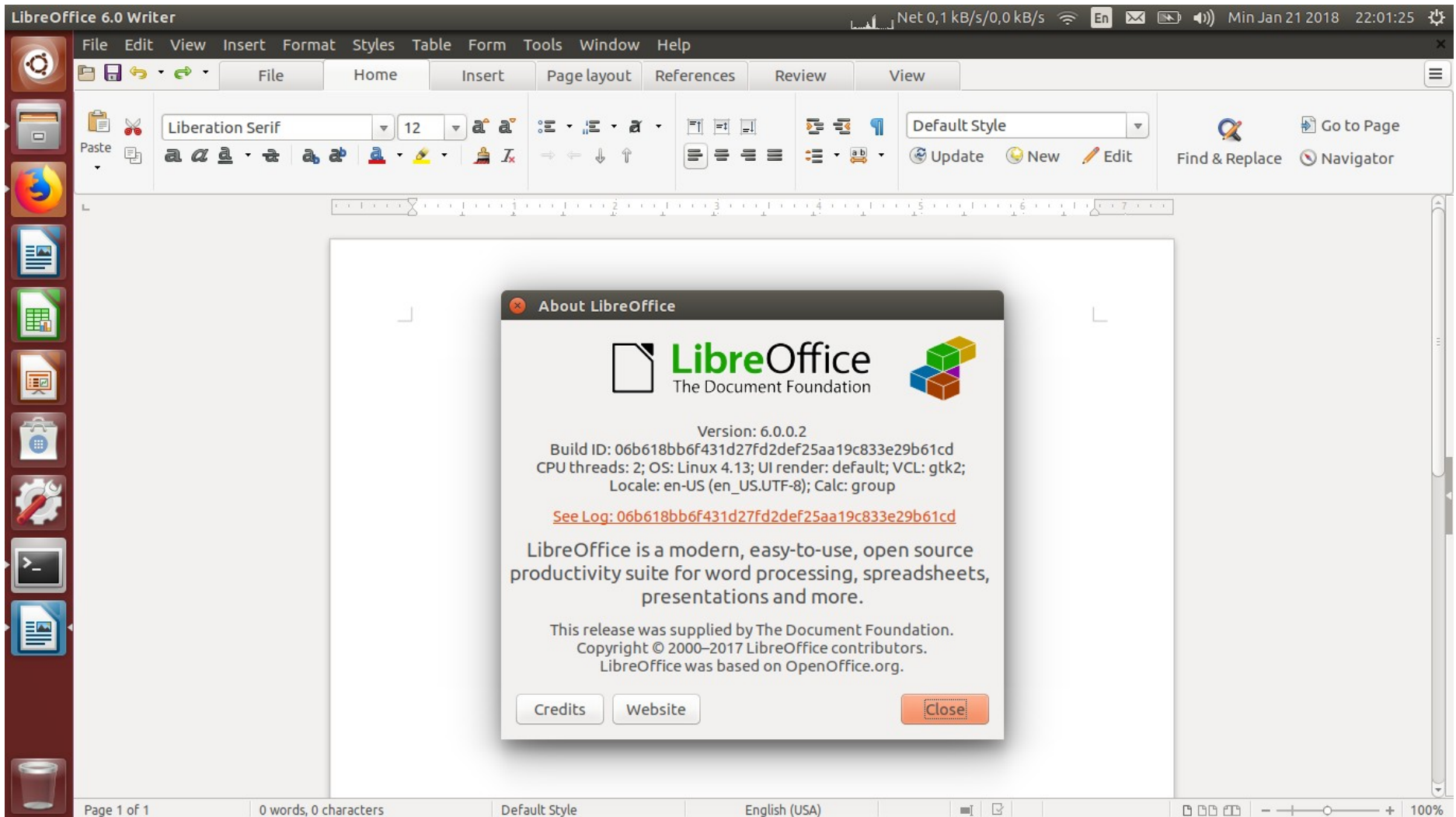
Search: ^ v EDITING ^ v 100% +

(source)

Apache OpenOffice 4.1.5, 2017



LibreOffice 6.0, 2018



(source)

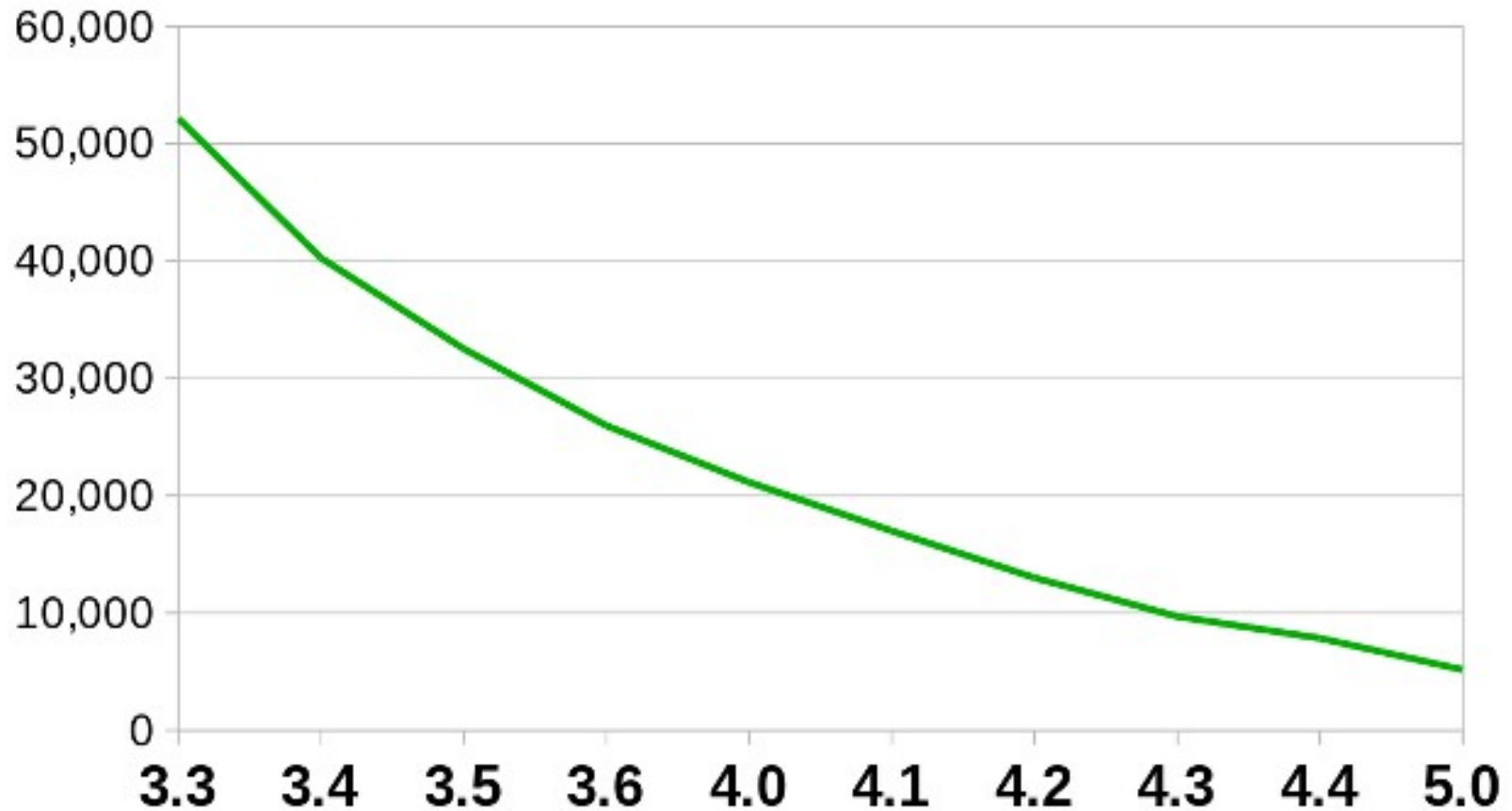
The project today

Development figures

- Around 400 weekly commits by 50 different authors
- 9M lines of code
- ~28 years of history
 - “Exact history was lost before Sept. 18th, 2000, but old source code comments show that Writer core dates back until at least November 1990.”
- Still 50000 lines of German code comments when LibreOffice was forked!
 - Bug closed in 2018

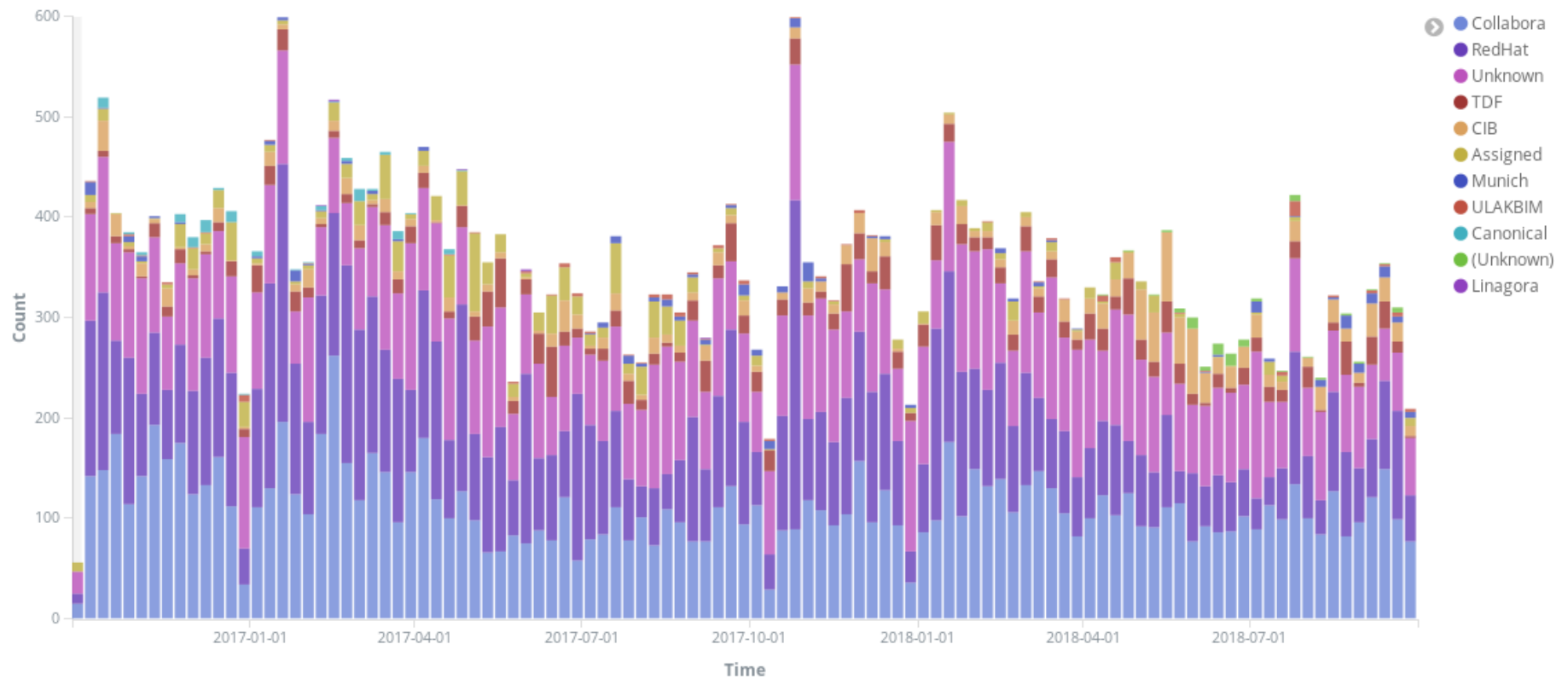
Stats: German comments

Detected lines of German comment



Stats: commits (Oct 16-Sep 18)

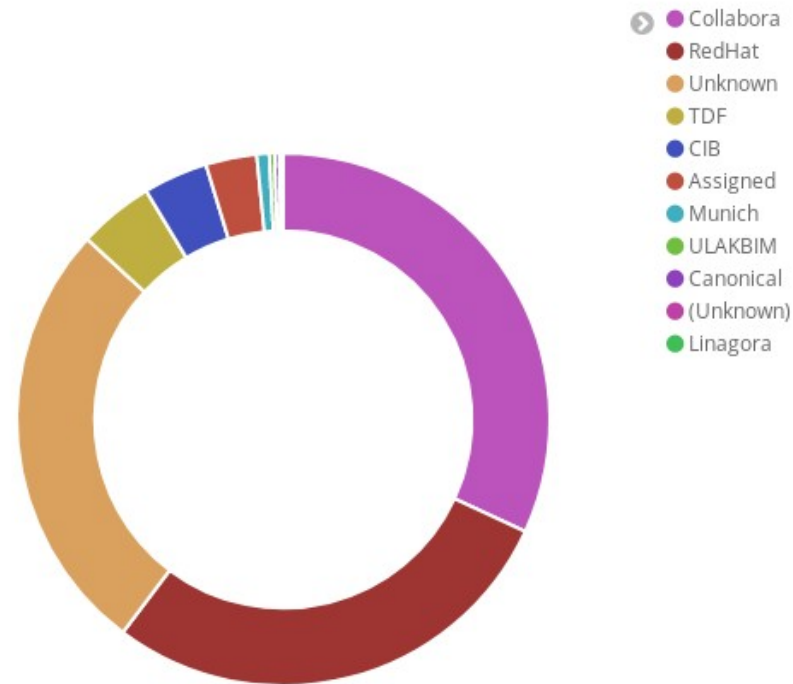
Organizations



(source)

Stats: commits (Oct 16-Sep 18)

Organizations



(source)

Release calendar

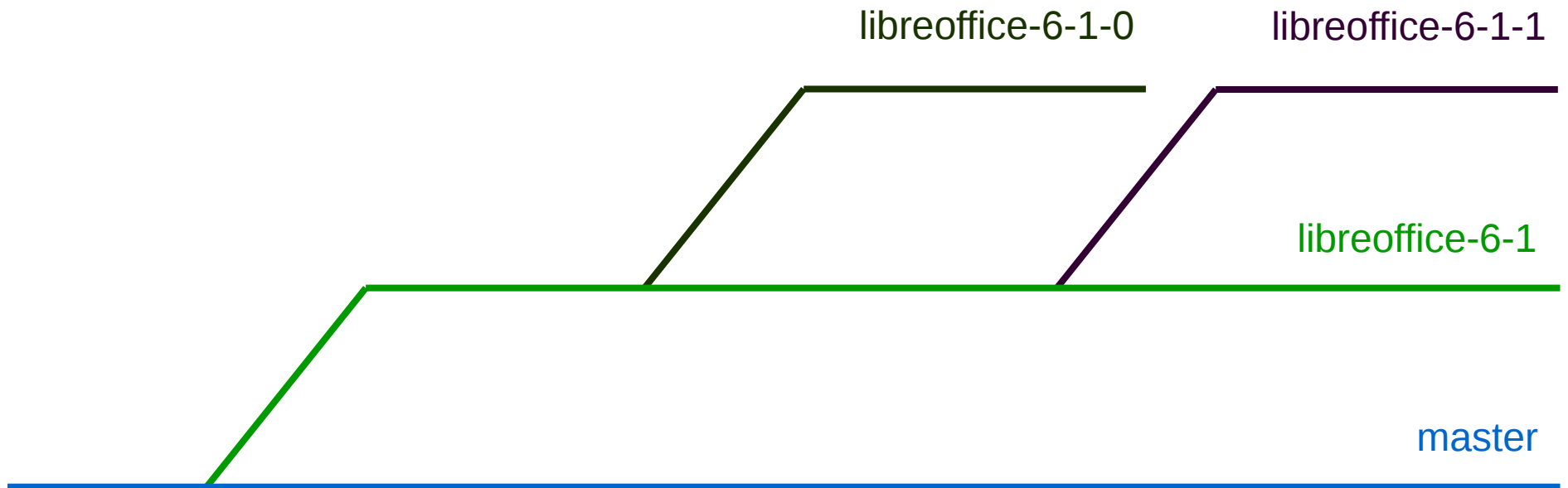
- *Release early, release often*
- Major release every six months (6.1.0)
 - Brings new features
- Minor release ~ every month (6.1.1, etc.)
 - Bugfixing only
- End of life: 9 months
- Always two versions coexisting
 - Right now: 6.0.6 and 6.1.2

Release calendar

- Plan for 5.0
 - <https://wiki.documentfoundation.org/ReleasePlan>

release	freeze	publishing
5.0.0	Week 21 , May 18, 2015 - May 24, 2015	Week 31 , Jul 27, 2015 – Aug 2, 2015
5.0.1	Week 31 , Jul 27, 2015 - Aug 2, 2015	Week 35 , Aug 24, 2015 - Aug 30, 2015
5.0.2	Week 36 , Aug 31, 2015 - Sep 6, 2015	Week 39 , Sep 21, 2015 - Sep 27, 2015
5.0.3	Week 41 , Oct 5, 2015 - Oct 11, 2015	Week 44 , Oct 26, 2015 - Nov 1, 2015
5.0.4	Week 48 , Nov 23, 2015 - Nov 29, 2015	Week 51 , Dec 14, 2015 - Dec 20, 2015
5.0.5	Week 3 , Jan 18, 2016 - Jan 24, 2016	Week 6 , Feb 8, 2016 - Feb 14, 2016
5.0.6	Week 15 , Apr 11, 2016 - Apr 17, 2016	Week 18 , May 2, 2016 - May 8, 2016
End of Life	May 29, 2016	

Branch model



Organizing a community

- The Document Foundation umbrella
 - Owns trademarks
 - Collects donations
 - Provides services to community
 - Organizes events
 - Occasionally funds development

Organizing a community

- Communication channels
 - Mailing lists
 - IRC
 - Bug tracker and code review
- Committees and teams
 - Engineering Steering Committee
 - Design team
 - QA team

Organizing a community

- Ultimately, individuals and companies define the project priorities by providing effort

Current lines of work

- Mobile and cloud versions
 - LibreOfficeKit API
- Support more document types
 - OOXML
 - Document Liberation Project
- GTK+ 3, Wayland, KDE Plasma
- UX improvements (design team)
- Polish

Architecture

General considerations

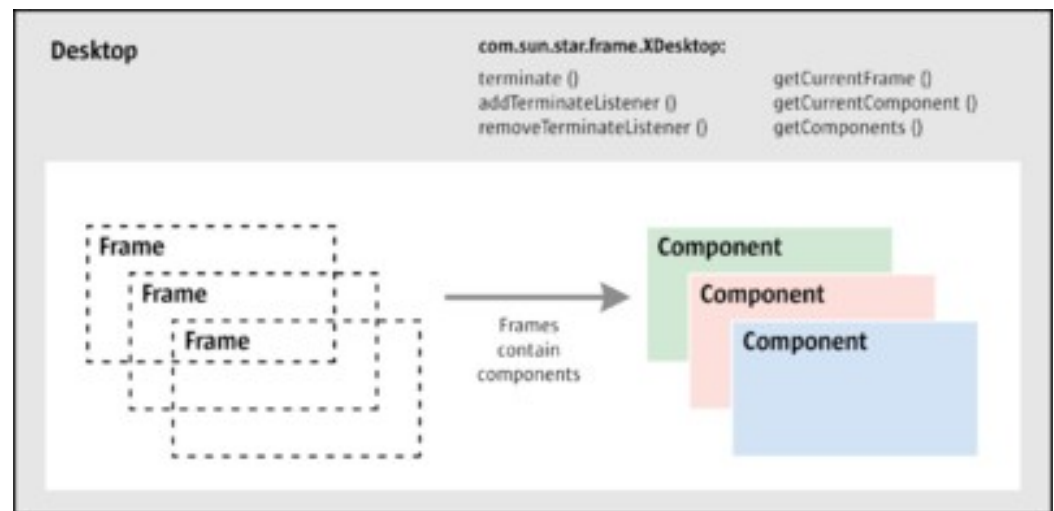
- There is not a global, application-wide design
 - Document filters: finite-state machine
 - VCL (visual components library): modeled after existing UI frameworks
 - Document model: Frame-Controller-Model

Frame-Controller-Model

- Model
 - Represents an object from the document
 - Text, shapes, spreadsheet cells
- Controller
 - Interaction between the screen and the model
 - Observes the model
 - Manipulates the presentation but not the model
- Frame
 - Bidirectional communication between controller and UI
 - Hierarchical organization

Other elements

- Component
 - Common interface between controller and frame
 - A frame can contain several components, which are either controllers of other frames
- Desktop
 - Hierarchy root frame
 - Specific interface



Dispatch framework

- Communication interfaces between components and UI
- Commands expressed by a URL
- Implemented in frames and controllers
- Responsibility chain
 - Traverse the hierarchy until reaching the one implementing the command

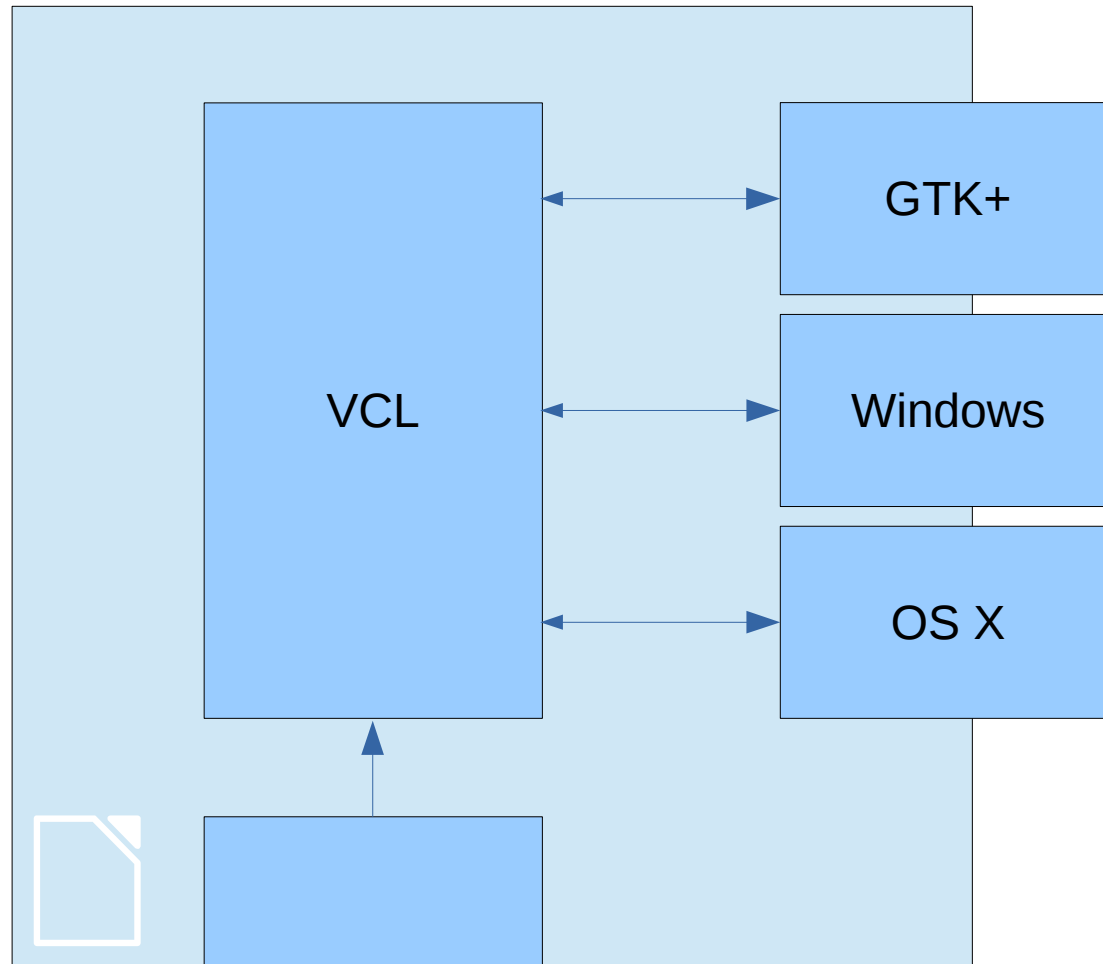
Other considerations

- Sometimes, interfaces expose the Frame-Controller-Model architecture but the implementation does not match
 - Historical reasons: architecture was engineered over an existing code base
 - Need to provide uniform API

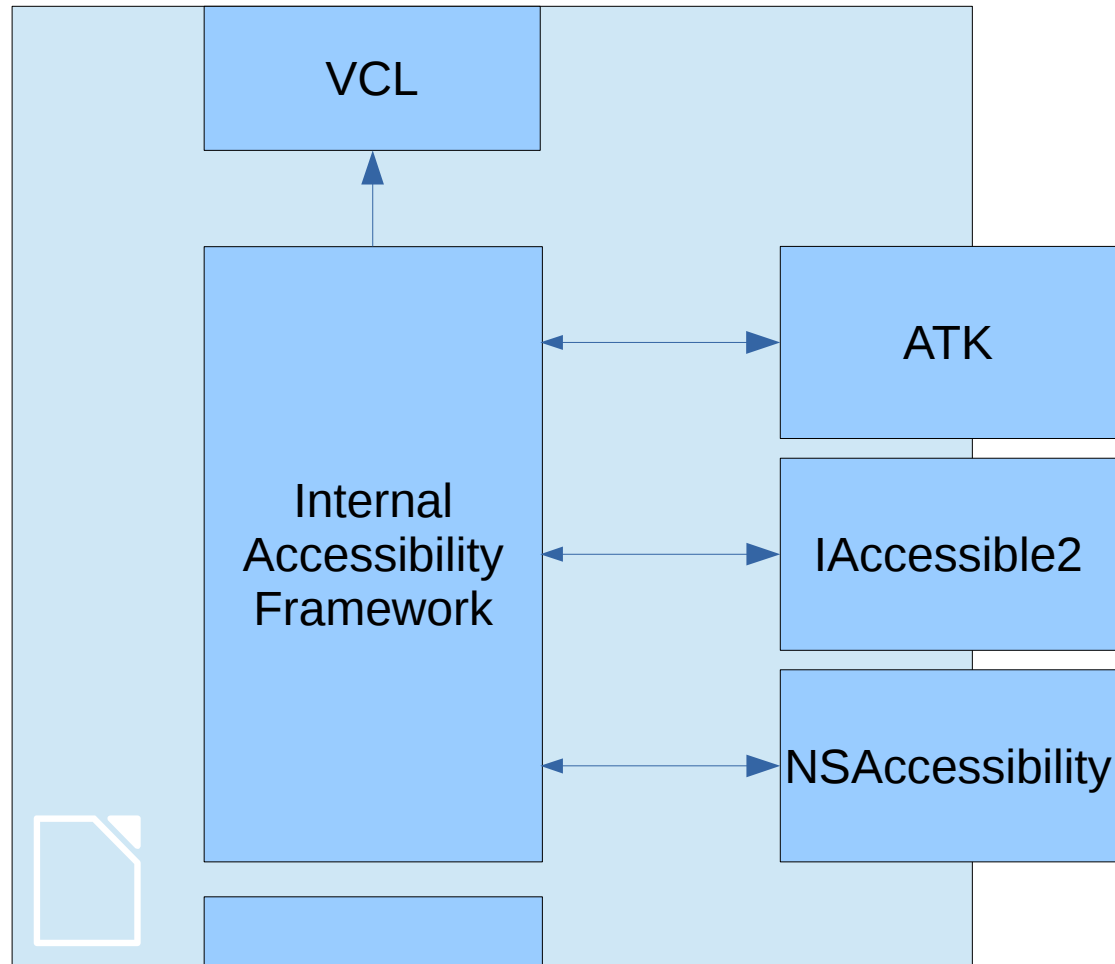
Visual components library

- Abstract UI elements: buttons, menus, etc.
- Each abstract element wraps an actual element of a supported UI framework
- Several UI frameworks available, enabled in compile time
 - GTK+, Windows, OSX

Visual components library



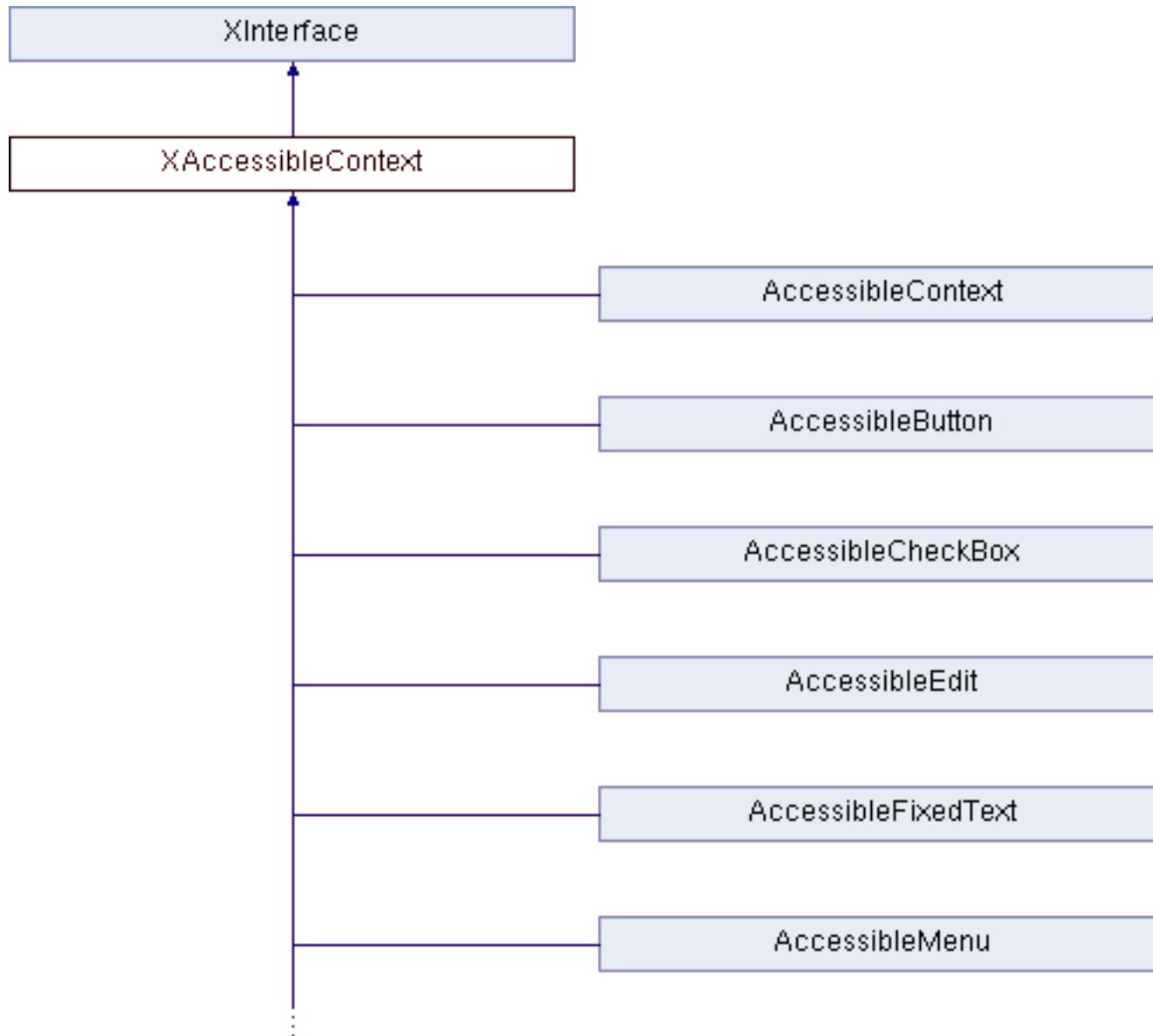
Accessibility framework



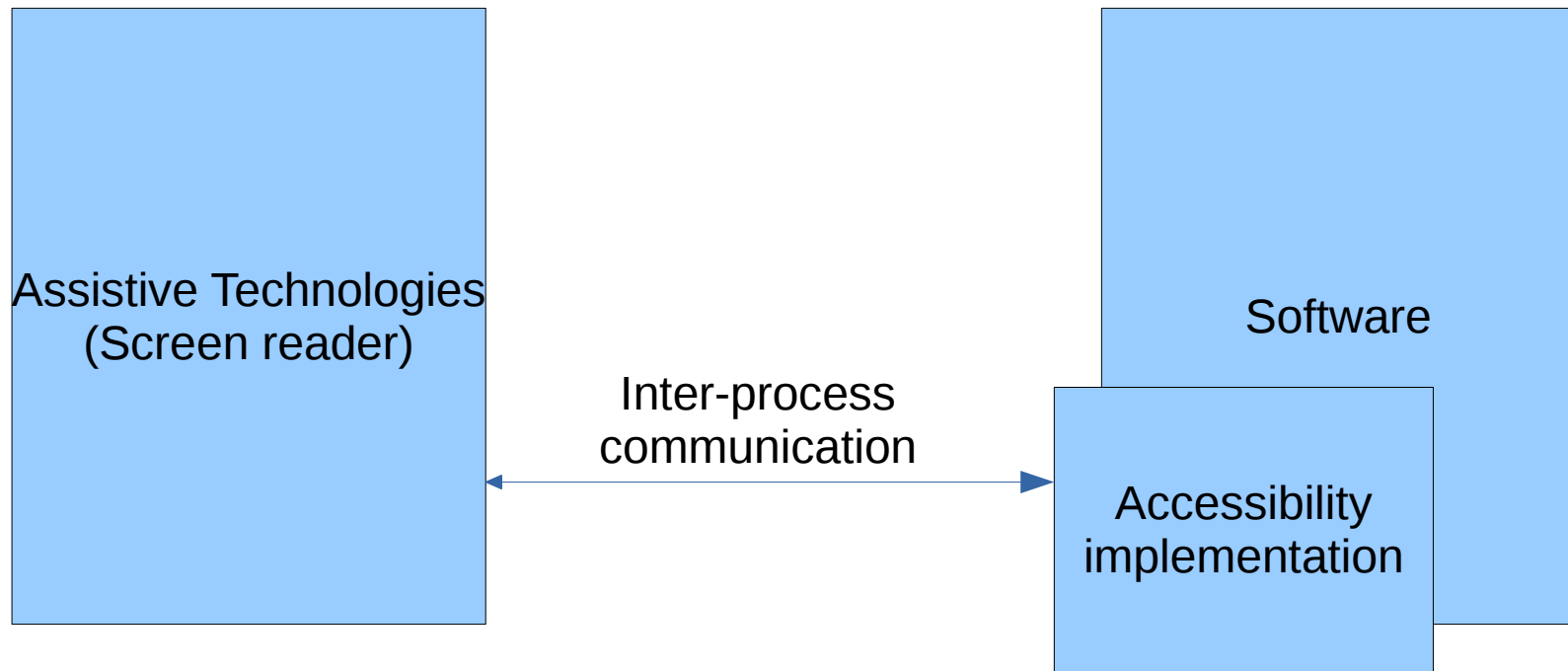
Accessibility framework

- Abstract accessible elements: buttons, menus, etc.
- Accessible elements match members of the VCL and wrap native classes of the a11y framework
- Several frameworks available, enabled in compile time
 - ATK (Linux), IAccessible2 (Windows), NSAccessibility (OSX)

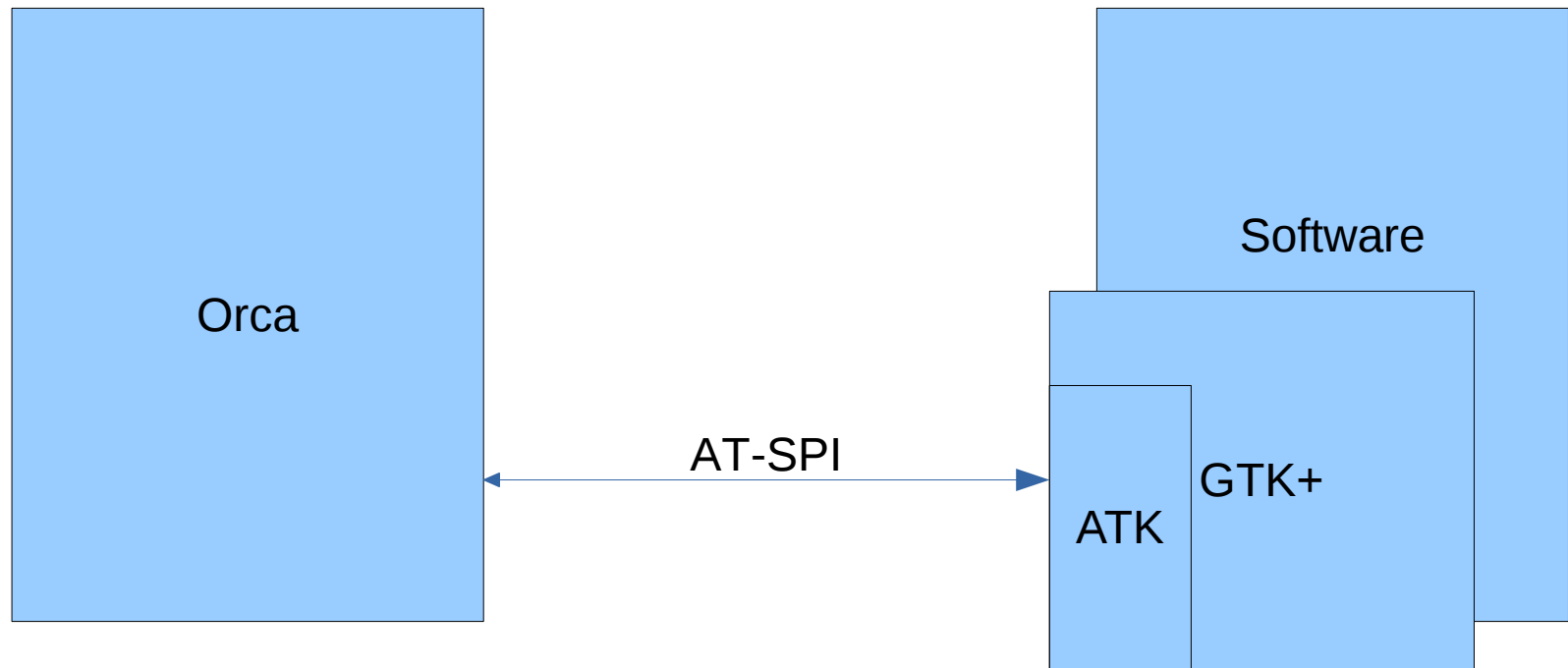
Interfaces involved in a11y



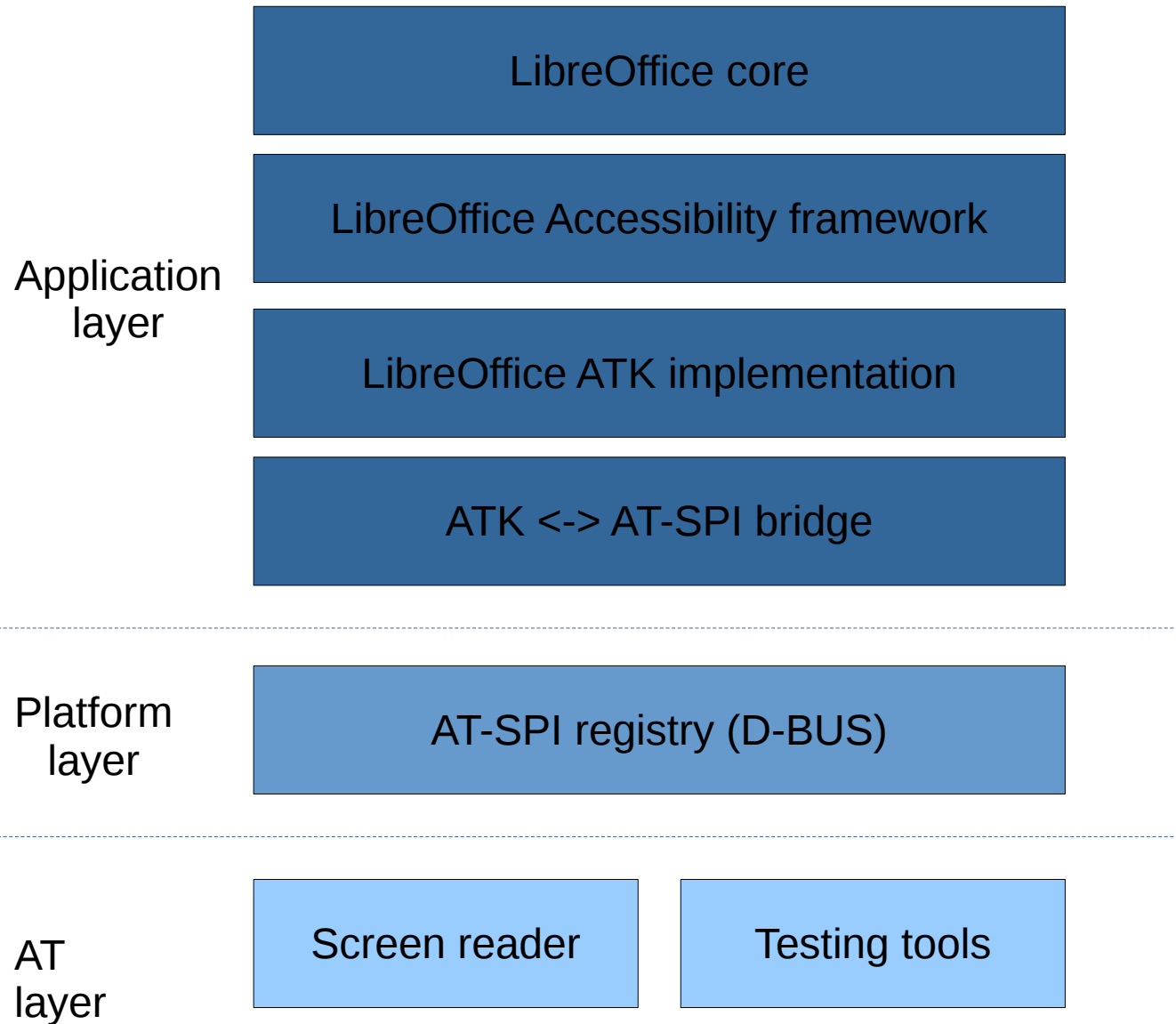
An abstract screen reader



Screen reader (GNOME)



Layers



Quality assurance

Techniques and tools

- Peer review
 - Unit tests
 - Continuous integration
 - *Crashtests*
 - Static code analysis
 - *Bug triaging*
- Regression detection tools
- Manual testing

Peer review

- master branch
 - Committers without review, 1 review for others
- libreoffice-6-1 branch:
 - Only bugfixing
 - +1 review in any case
- libreoffice-6-1-x branches:
 - Only patches from 6-1 branch
 - +2 reviews

Peer review

Change 12213 by sushil_shinde Review in Progress 

Reviewers
CC [test_jenkins_mac](#)
Project [core](#)
Branch [master](#)
Strategy Cherry Pick

Updated 23 hours ago
Change-Id [I5d664867c982e48d2ff01363659282354822e541](#)
Topic

Commit 781575e97a42e7873e5de11f7e987151e0591292 ([gitweb](#))
Author [sushil_shinde <sushilshinde@libreoffice.org>](#) Nov 3, 2014 8:23 AM
Committer [sushil_shinde <sushilshinde@libreoffice.org>](#) Nov 3, 2014 10:53 AM
[fdo#85491](#) : break parameter incorrectly set in .XLSX import.




- 1) TextBreak Parameter was bydefault 'false'.
- 2) At xichart.cxx::convert() [line:2973] 'TextBreak' property was changed as per 'labelFreq' value.
- 4) I have done same thing here and by doing this no existing unit test was failed.
- 5) Added unit test to check 'TextBreak' value for chart.

Change-Id: [I5d664867c982e48d2ff01363659282354822e541](#)

Code-Review
Verified

Files

Diff against:

File Path	Comments	Size
Commit Message		
chart2/qa/extras/chart2import.cxx		21 
A chart2/qa/extras/data/xlsx/chart-label-text-break.xlsx		
oox/source/drawingml/chart/axisconverter.cxx		2 
	+22, -1	

History

sushil_shinde
Uploaded patch set 1.

test_jenkins_mac
Patch Set 1:
Build Started http://ci.libreoffice.org/job/gerrit_master/431/

test_jenkins_mac
Patch Set 1:
Build Successful
http://ci.libreoffice.org/job/gerrit_master/431/ : SUCCESS

Unit tests

- Check key elements in documents
 - Import
 - Import + export + import
- Variable coverage
 - Good coverage for new document formats
- No automated UI testing as for now

Continuous integration

- Several machines are periodically compiling LibreOffice
 - Daily or several times per day
 - Also run unit tests
- Compile patches in code review
- Different platforms
 - All supported platforms and some more (Android, iOS)
- Different compilation options

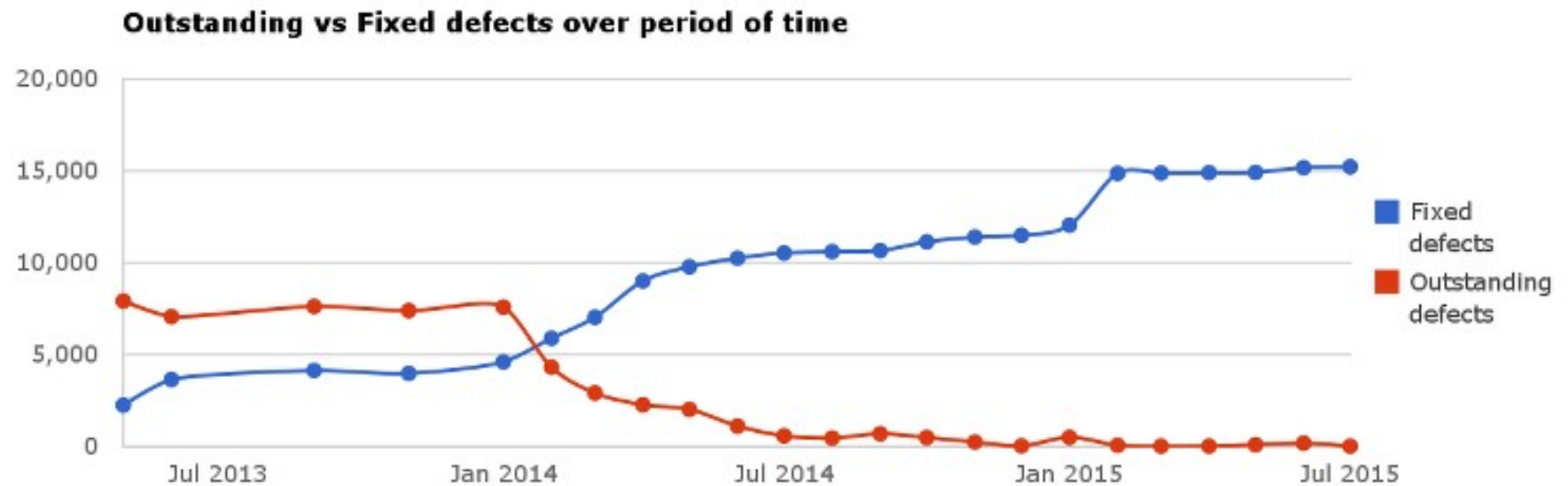
Crashtests

- Check crashes when opening and saving documents
- Sample size: 92000 documents
 - Most come from bug reports
- Periodicity: weekly

Static code analysis

- Tool *Coverity Scan*
 - Free for open source projects
- Detects: dead code, uninitialized variables, uncaught exceptions...
- Defect density reduced from 1,1 to ~0
 - Density measured in defects every 1000 lines
 - Average for similar sized projects: 0,71

Static code analysis



Bug triaging

- Periodically check bugzilla reports
 - Confirm bugs
 - Detect duplicates
 - Prioritize
 - Verify patches

Regression detection tools

- Regression: a problem that was not present in previous versions
- Main tool to fix regressions: *bisect*
 - Binary search of the guilty commit
 - Recompilation cycle makes it unfeasible in LibreOffice
- LibreOffice tool: *bi-bisect (binary bisect)*
 - Binary repository from different development stages
 - Recompilation not necessary

Manual testing

- List of tests to be manually run
 - Tool: MozTrap
 - Testing rounds for every pre-release (betas, release candidates)
- “Freestyle” testing
- Bug hunting sessions

¡Thank you!

