

```
static void  
properties(GObjectClass  
    *gobject_class)  
{  
    GObjectSpec *pspec;  
  
    /* ... */  
    g_object_class_install_attribute(*/  
        guint64,  
        CODE,  
        "code.",  
        "code",  
        0,  
        64,  
        /* ... */  
    );  
}
```

blogs.igalia.com/jaragunde

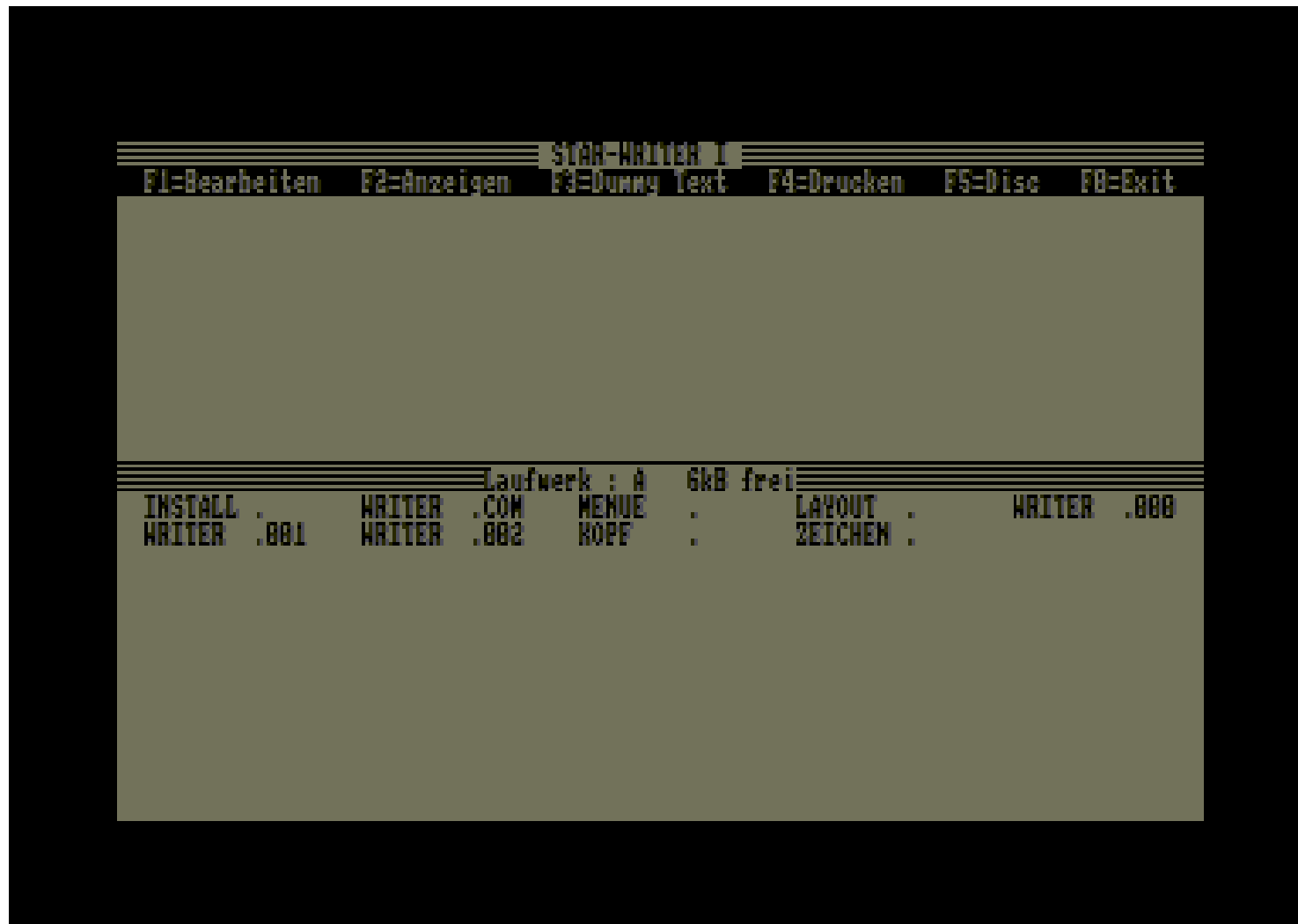


The project

Some history

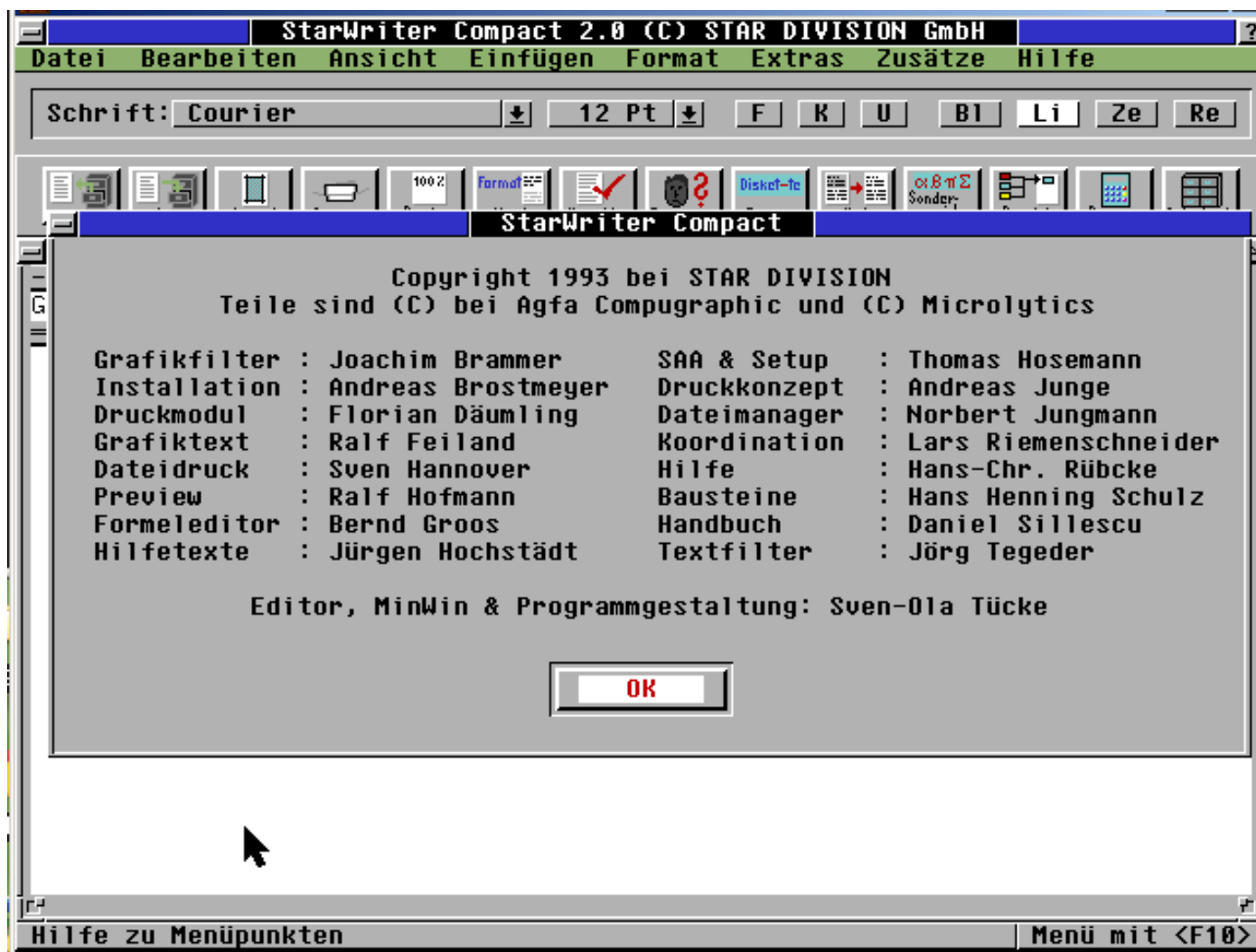
- 1985: StarWriter for Z80 micros
- 1986: StarDivision founded, StarOffice
- 1999: Sun Microsystems acquires StarDivision
- 2000: OpenOffice becomes Free Software
- 2002: OpenOffice 1.0
- 2005: OASIS standard, OpenOffice 2.0
- 2010: Oracle acquires Sun
- 2010: LibreOffice and The Document Foundation
- 2011: Apache OpenOffice

StarWriter 1.0, 1986



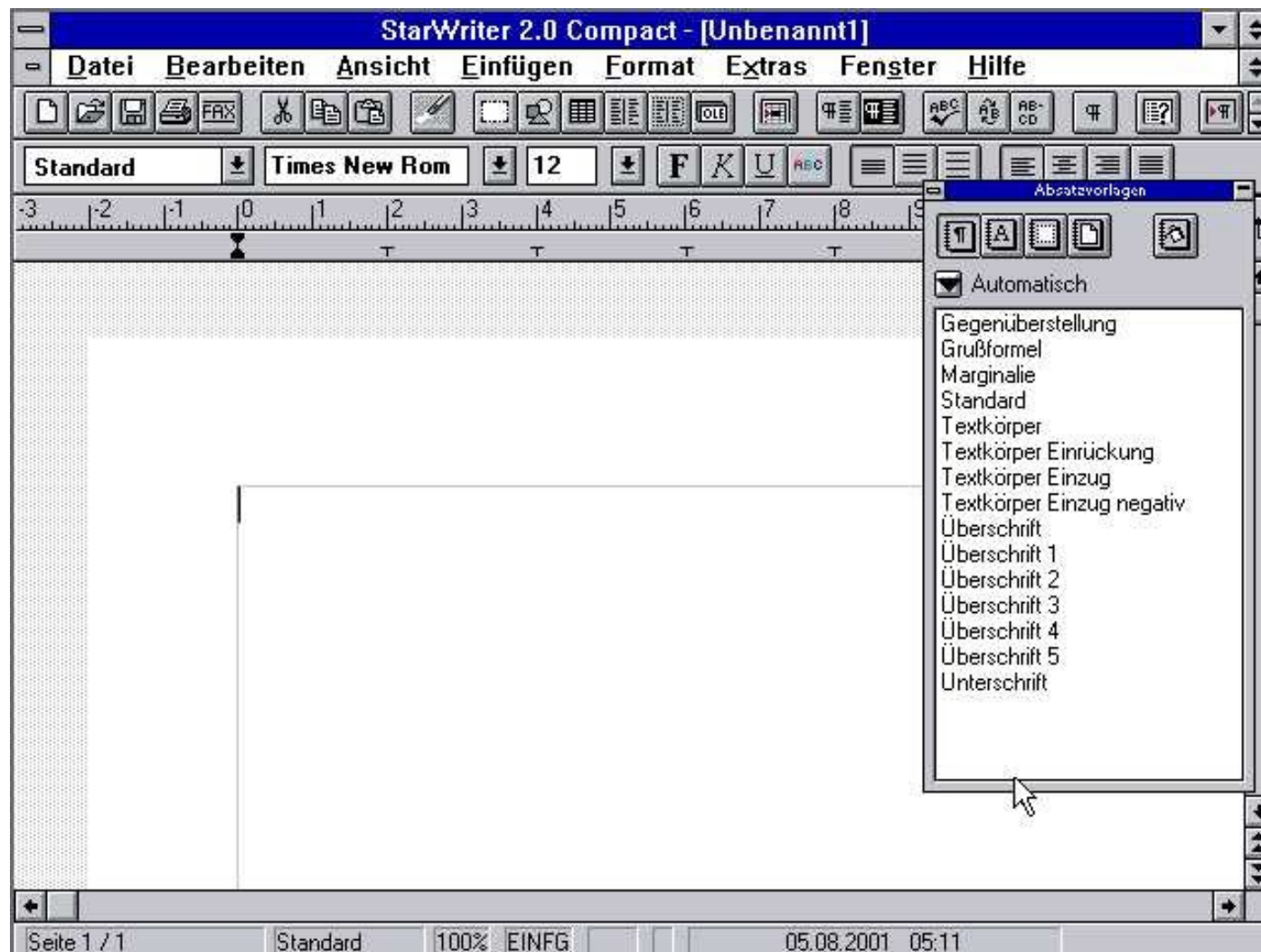
(source)

StarOffice 2.0, 1994



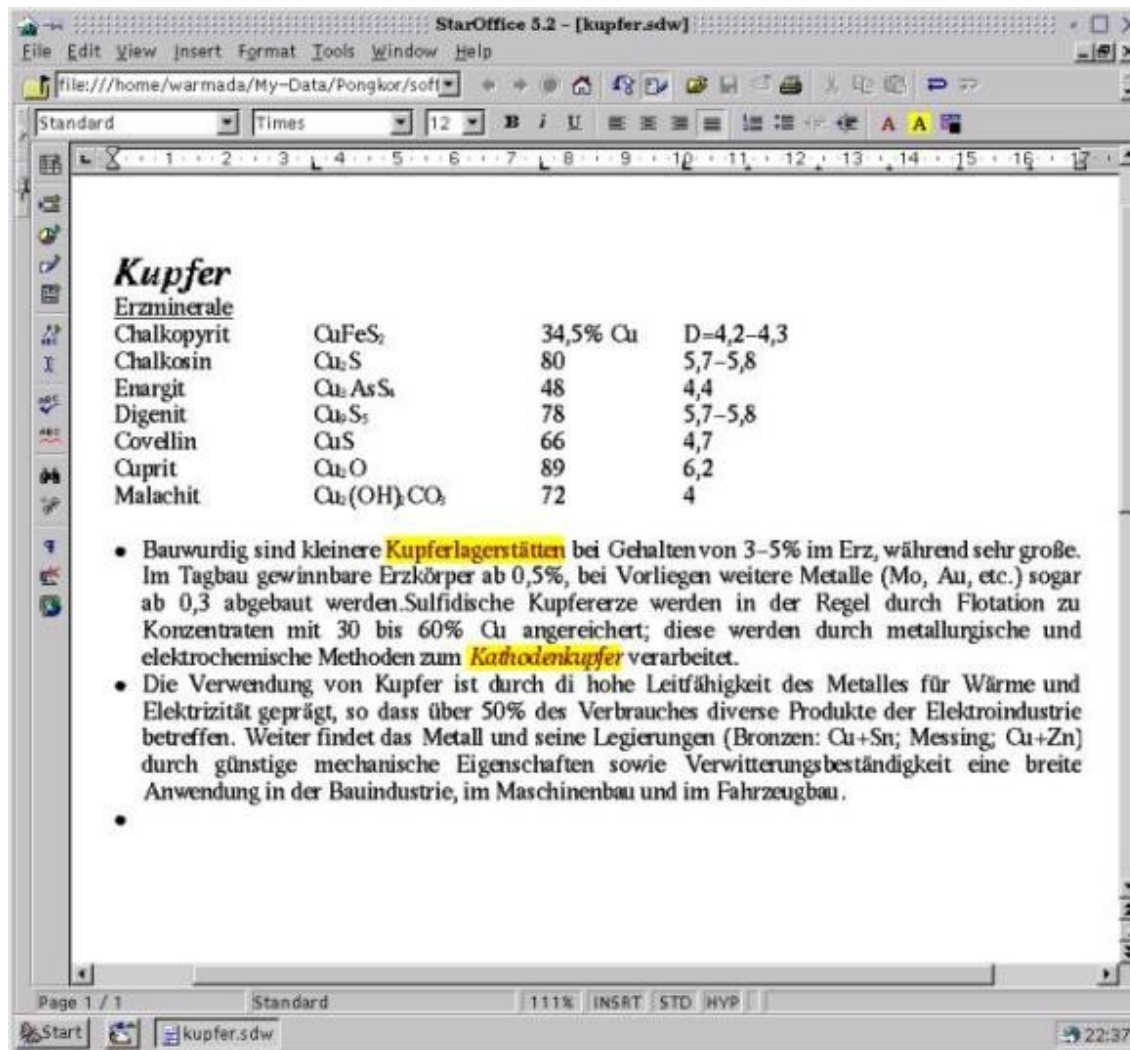
(source)

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 | CuS | 66 | 4,7 |
| Cuprit | Cu_2O | 89 | 6,2 |
| Malachit | $\text{Cu}_2(\text{OH})_2\text{CO}_3$ | 72 | 4 |

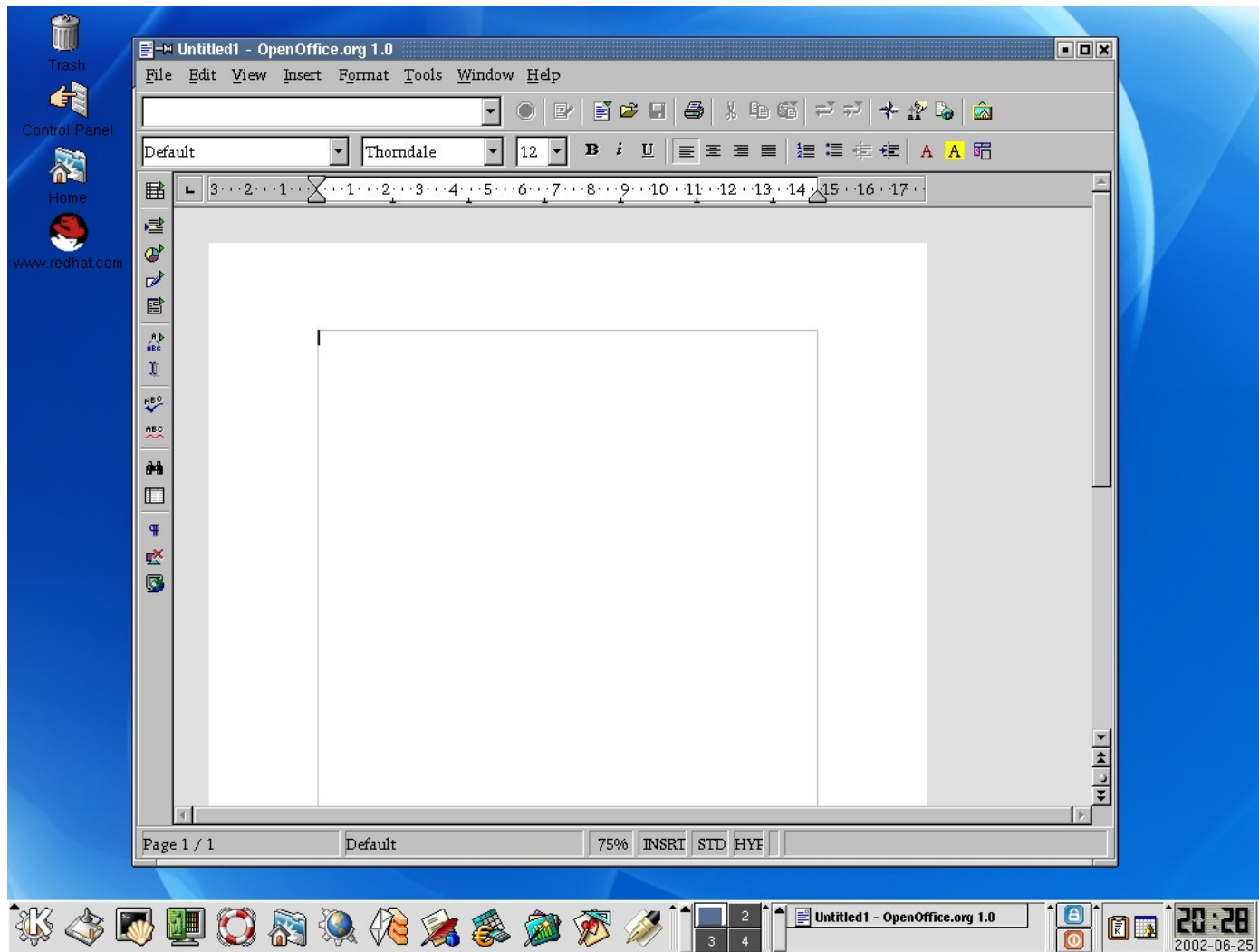
- Bauwürdig sind kleinere **Kupferlagerstätten** bei Gehalten von 3-5% im Erz, während sehr große. Im Tagbau gewinnbare Erzkörper ab 0,5%, bei Vorliegen weitere Metalle (Mo, Au, etc.) sogar ab 0,3 abgebaut werden. Sulfidische Kupfererze werden in der Regel durch Flotation zu Konzentraten mit 30 bis 60% 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% INSR STD HYP

Start kupfer.sdw 22:37

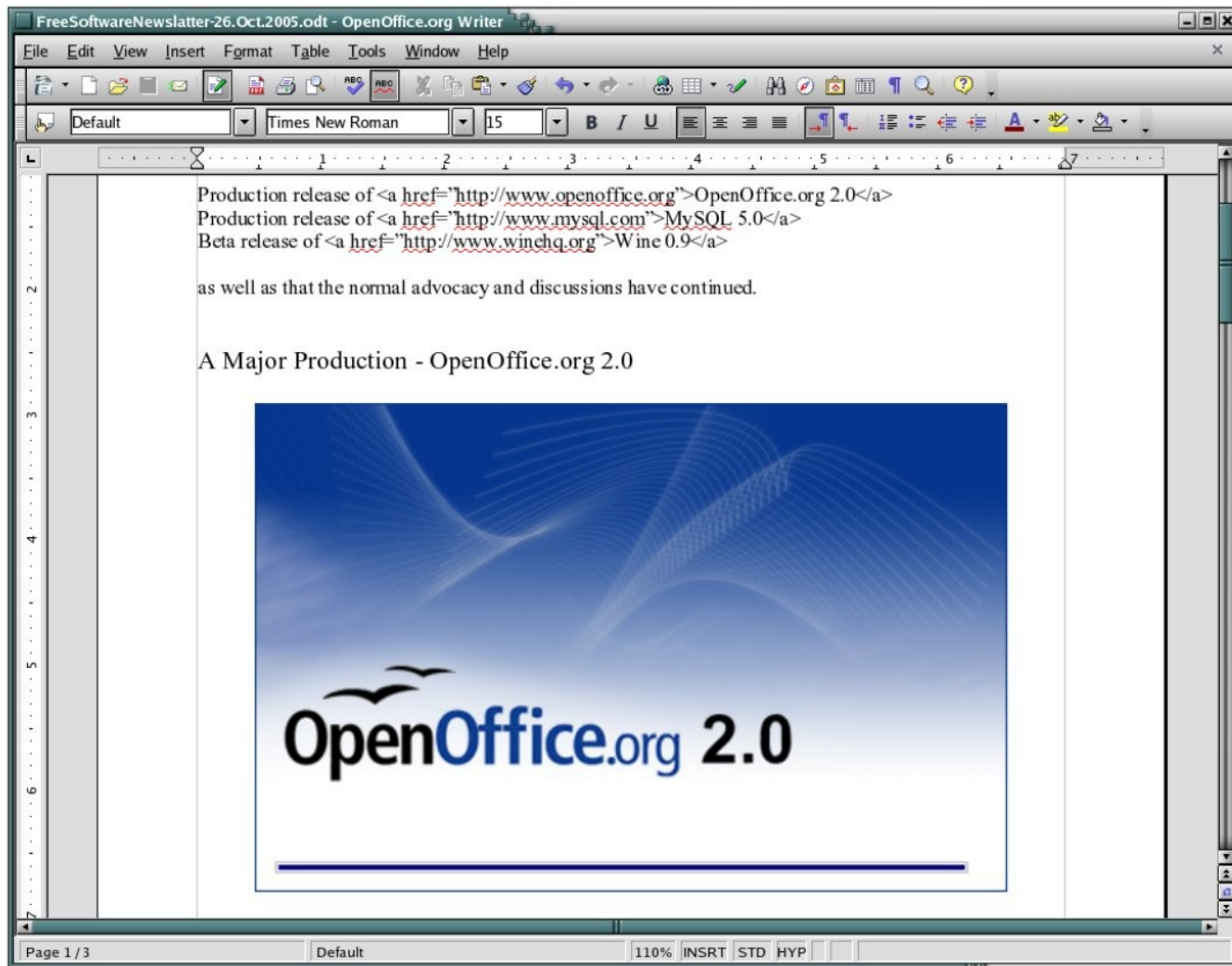
(source)

OpenOffice.org 1.0, 2002



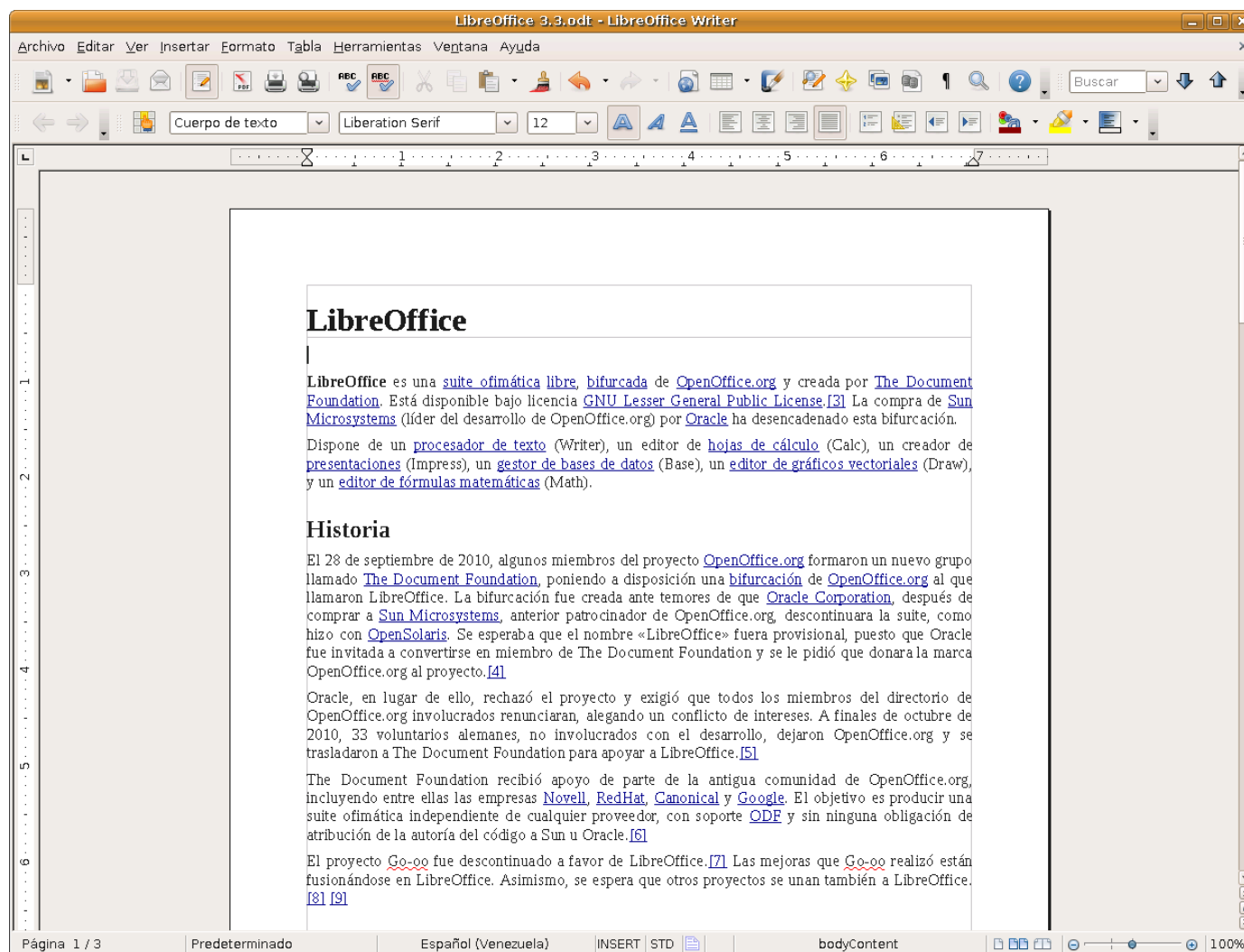
(source)

OpenOffice.org 2.0, 2005



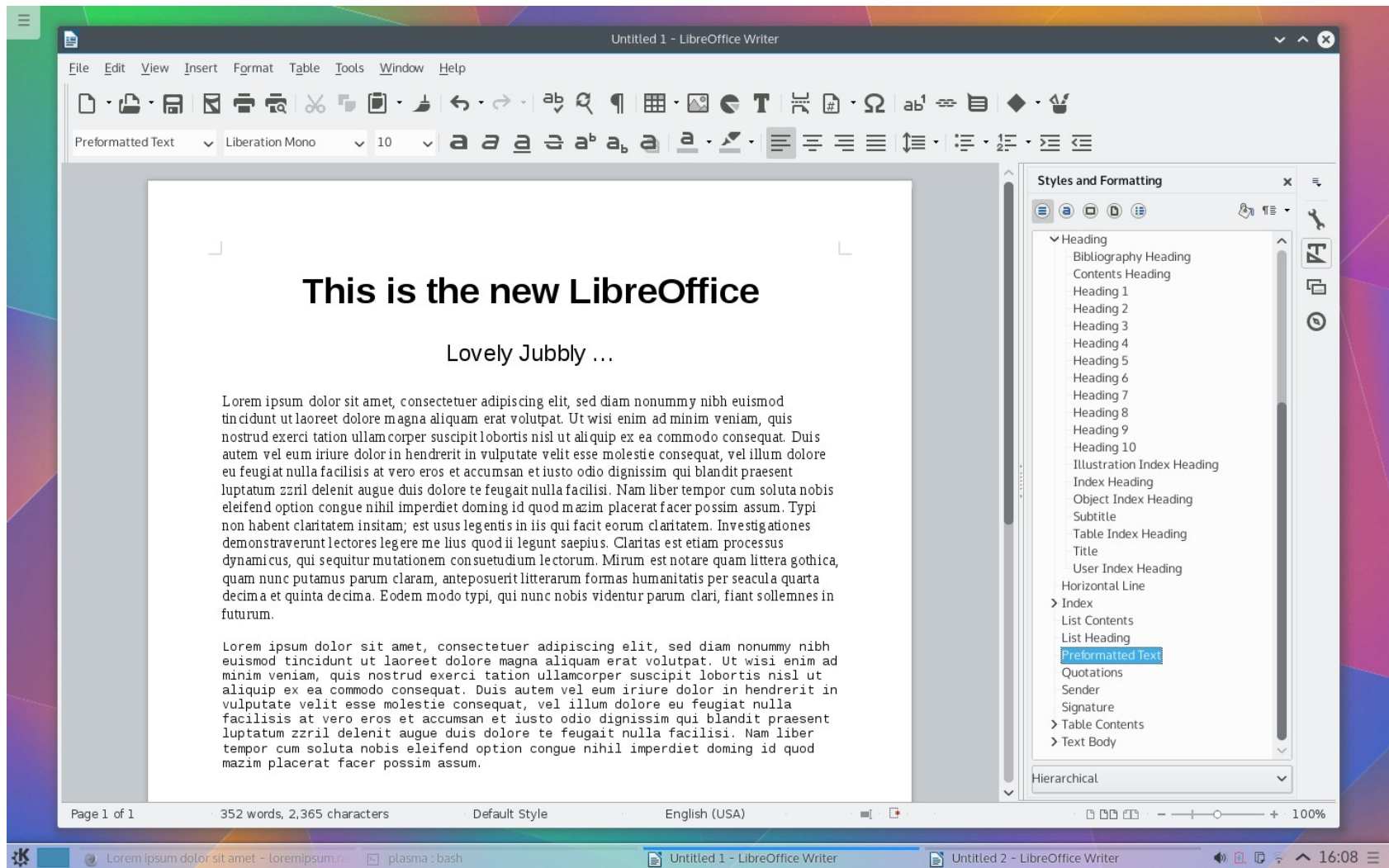
(source)

LibreOffice 3.3, 2010



(source)

LibreOffice 5.0, 2015



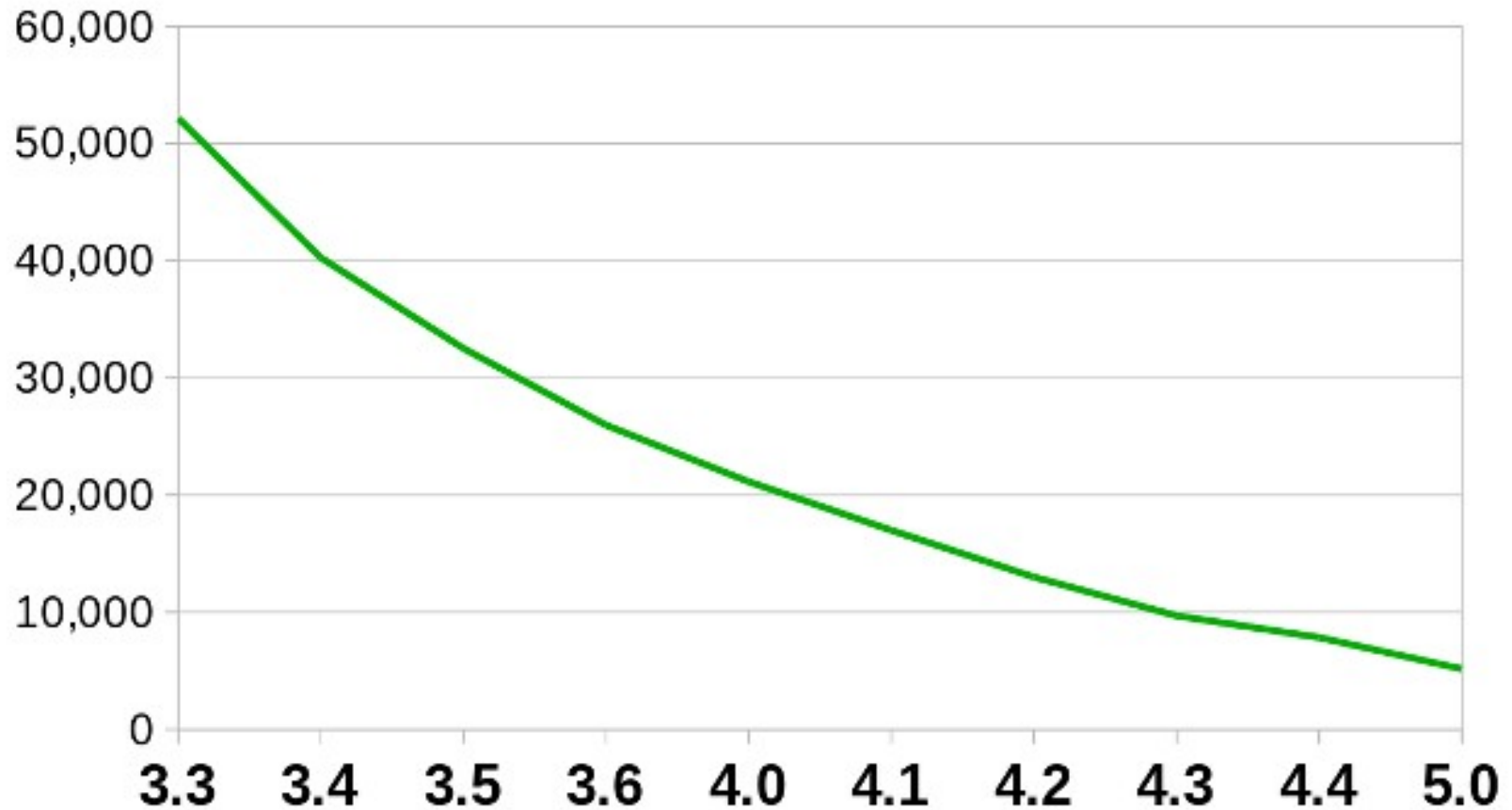
(source)

LibreOffice today

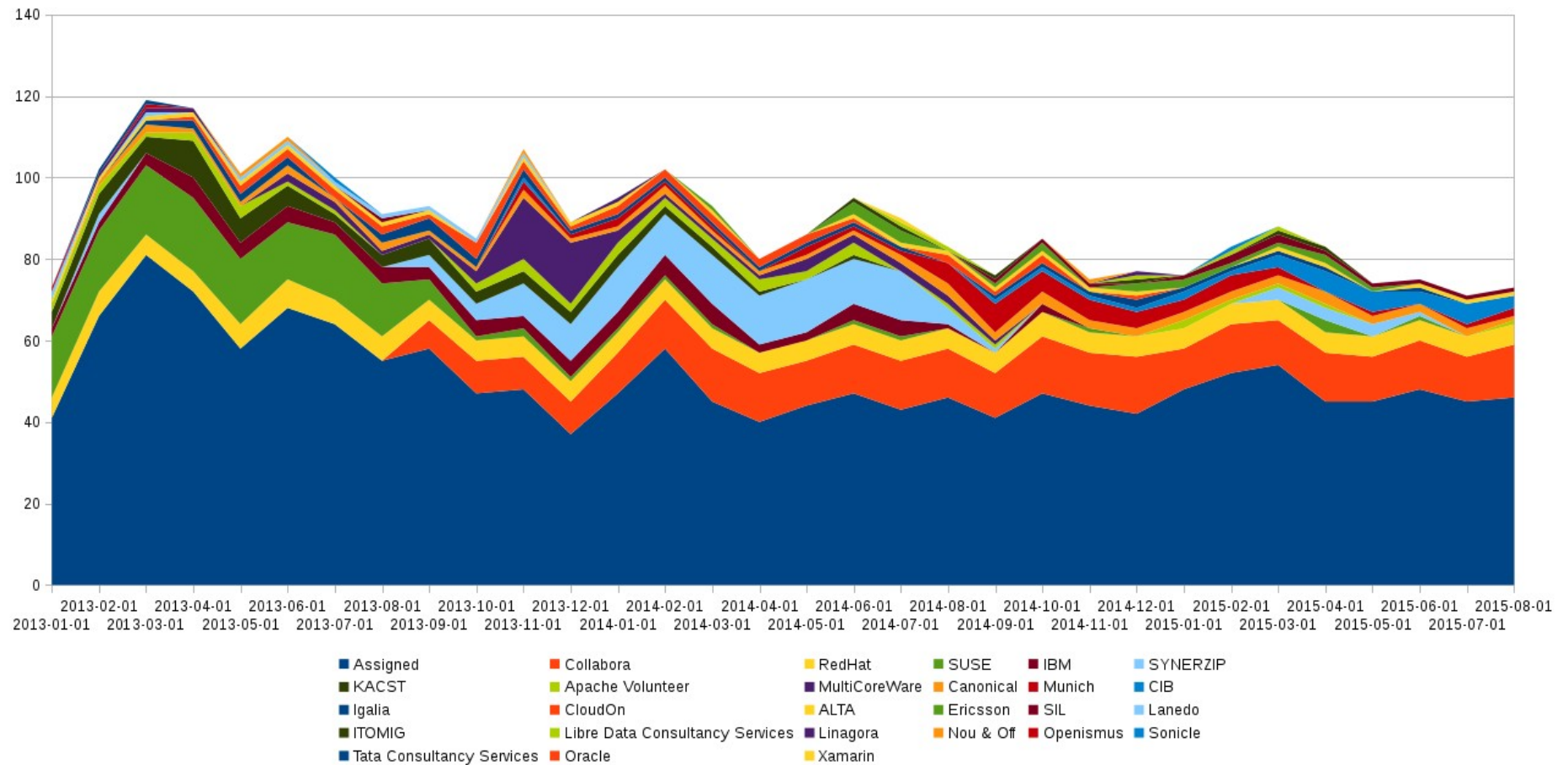
- Around 80 monthly committers and 1600 commits
- 7M lines of code
- ~25 years of history
 - `"Exact history was lost before Sept. 18th, 2000, but old source code comments show that Writer core dates back until at least November 1990."`
- 5000 lines of German code comments!

Stats: German comments

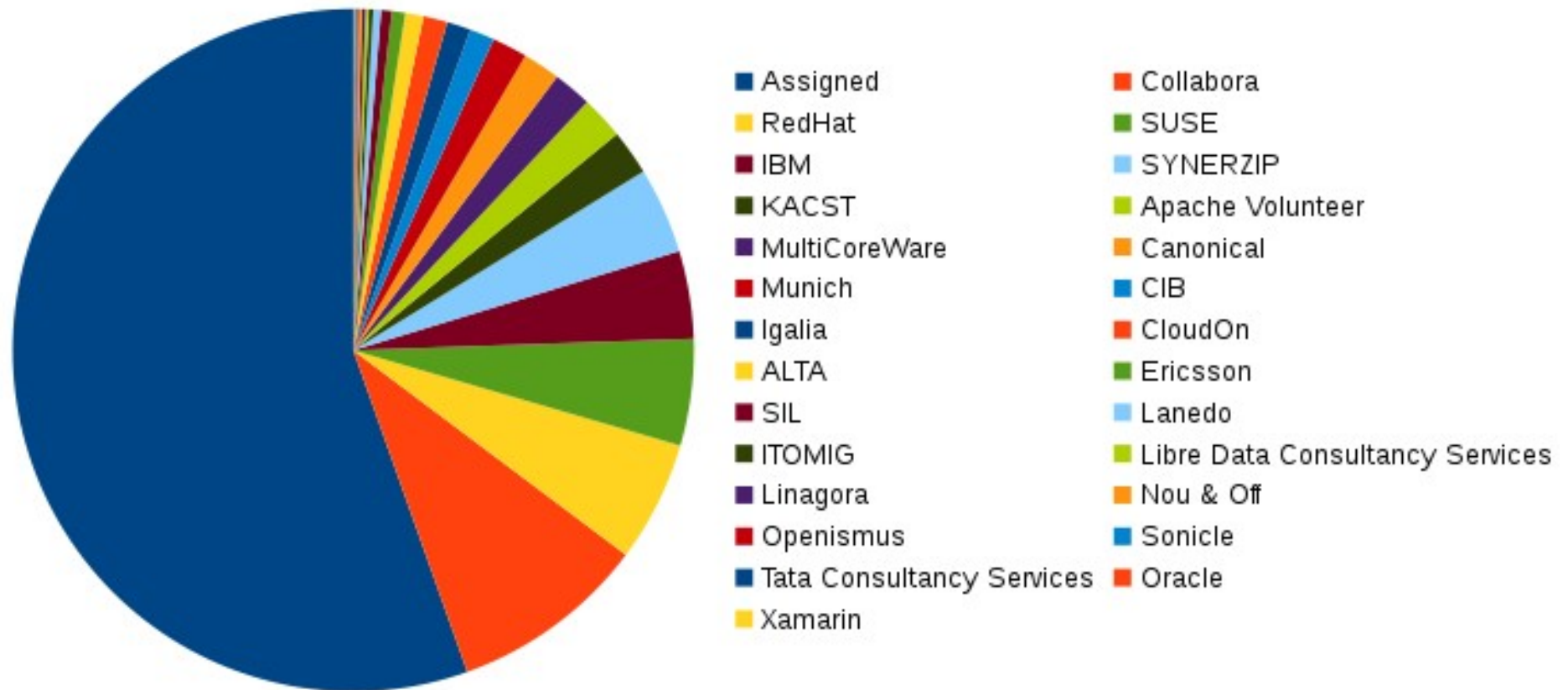
Detected lines of German comment



Unique committers per month by affiliation

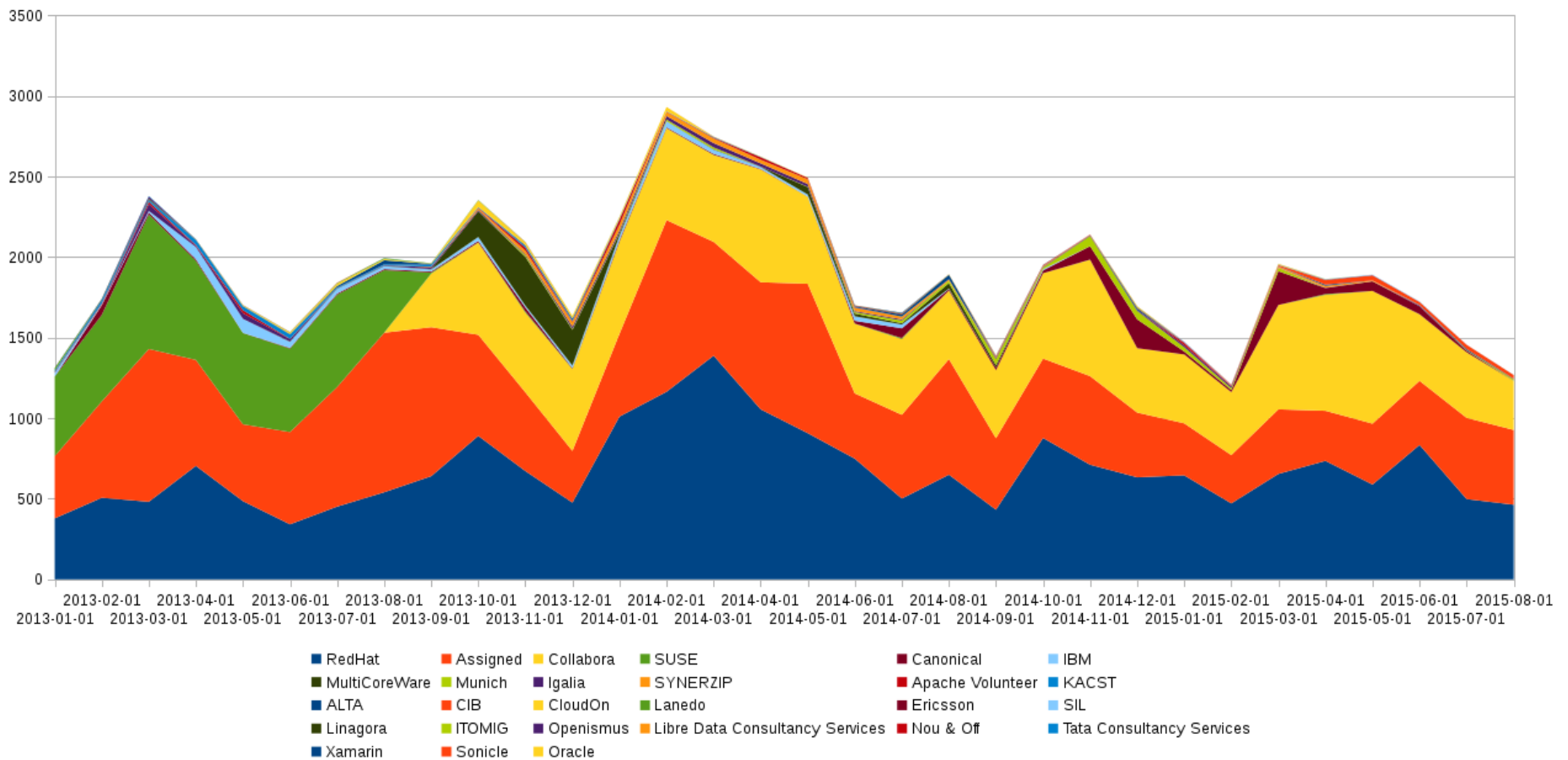


Stats: contributors

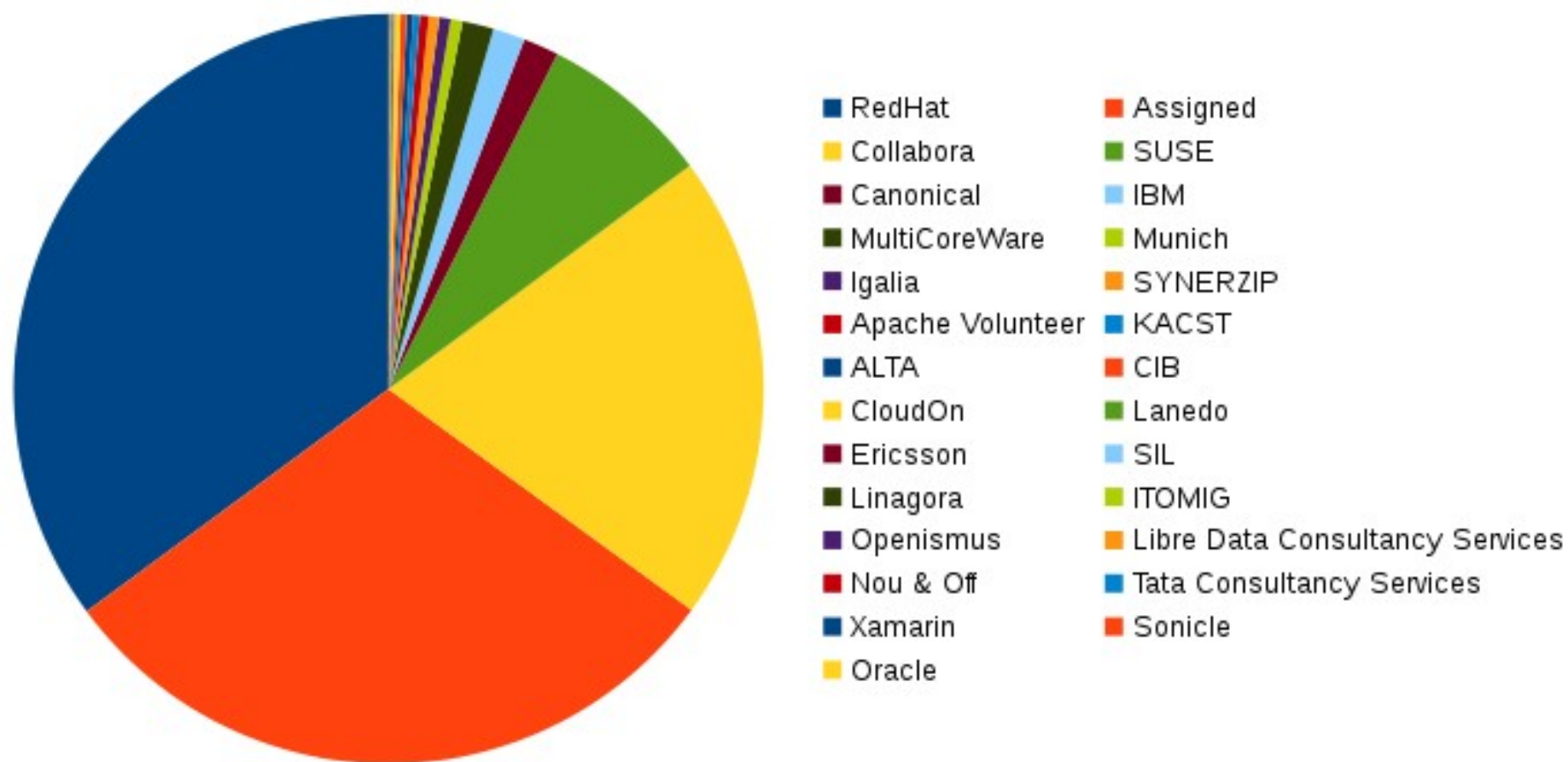


Stats: commits

Commits per month by affiliation



Stats: commits



Release calendar

- *Release early, release often*
- Major release every six months (5.0.0)
 - Brings new features
- Minor release ~ every month (5.0.1, etc.)
 - Bugfixing only
- End of life: 9 months
- Always two versions coexisting
 - Right now: 4.4.5 and 5.0.2

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 | |

Future

- Mobile and cloud versions
 - LibreOfficeKit API
- Support more document types
 - Document Liberation Project
 - OOXML in particular
- GTK+ 3, Wayland
- Polish

Architecture

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
 - Bridge between the controller and window objects
 - Bidirectional communication between controller and UI

Other elements

- Component
 - Common interface between controller and frame
 - Hierarchical organization
- Desktop
 - Root frame
- Window
 - Area with painting and interaction capabilities
 - Not necessarily a system window

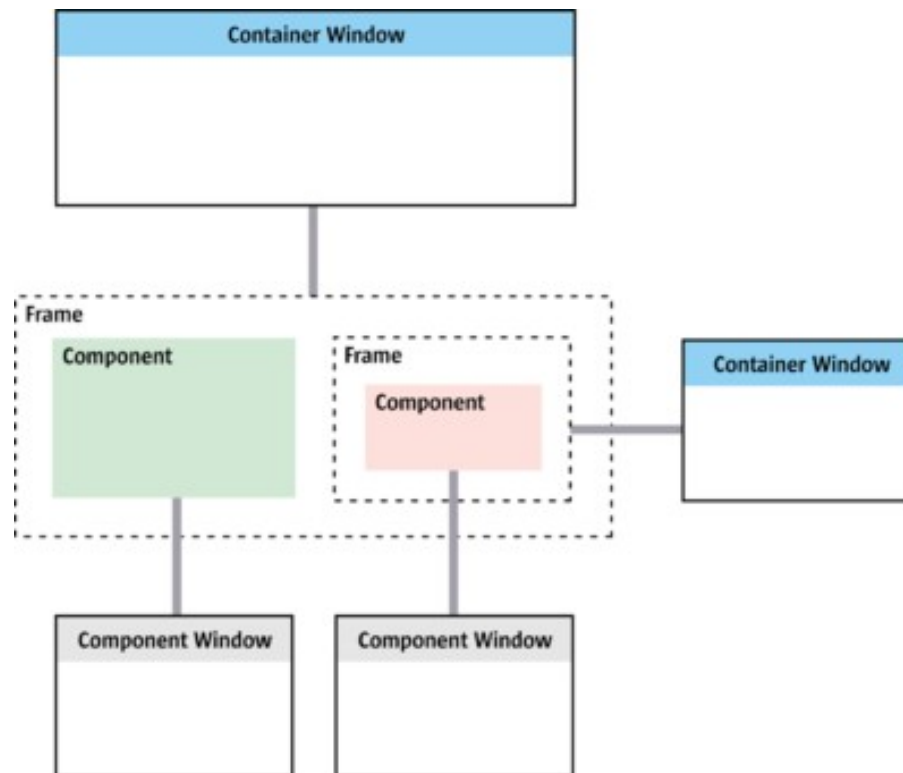
Components and windows

- A frame attaches a component with two windows
 - Component window
 - Component painting area
 - Receives user interaction
 - Container window
 - Event broadcast
 - Interaction with other windows



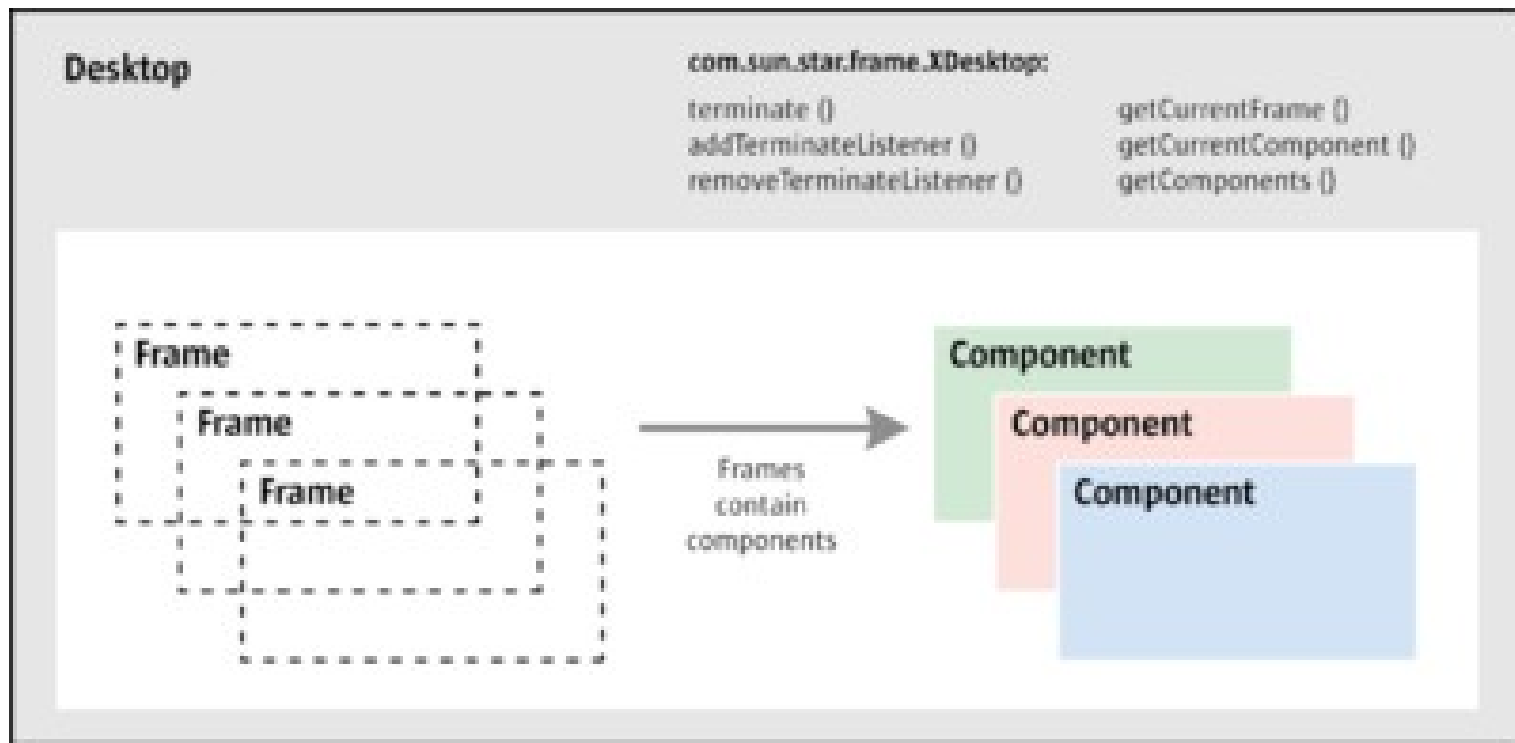
Component hierarchy

- A frame can contain several components
- Sub-frame: dependent window
 - Floating text, dockable window...



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

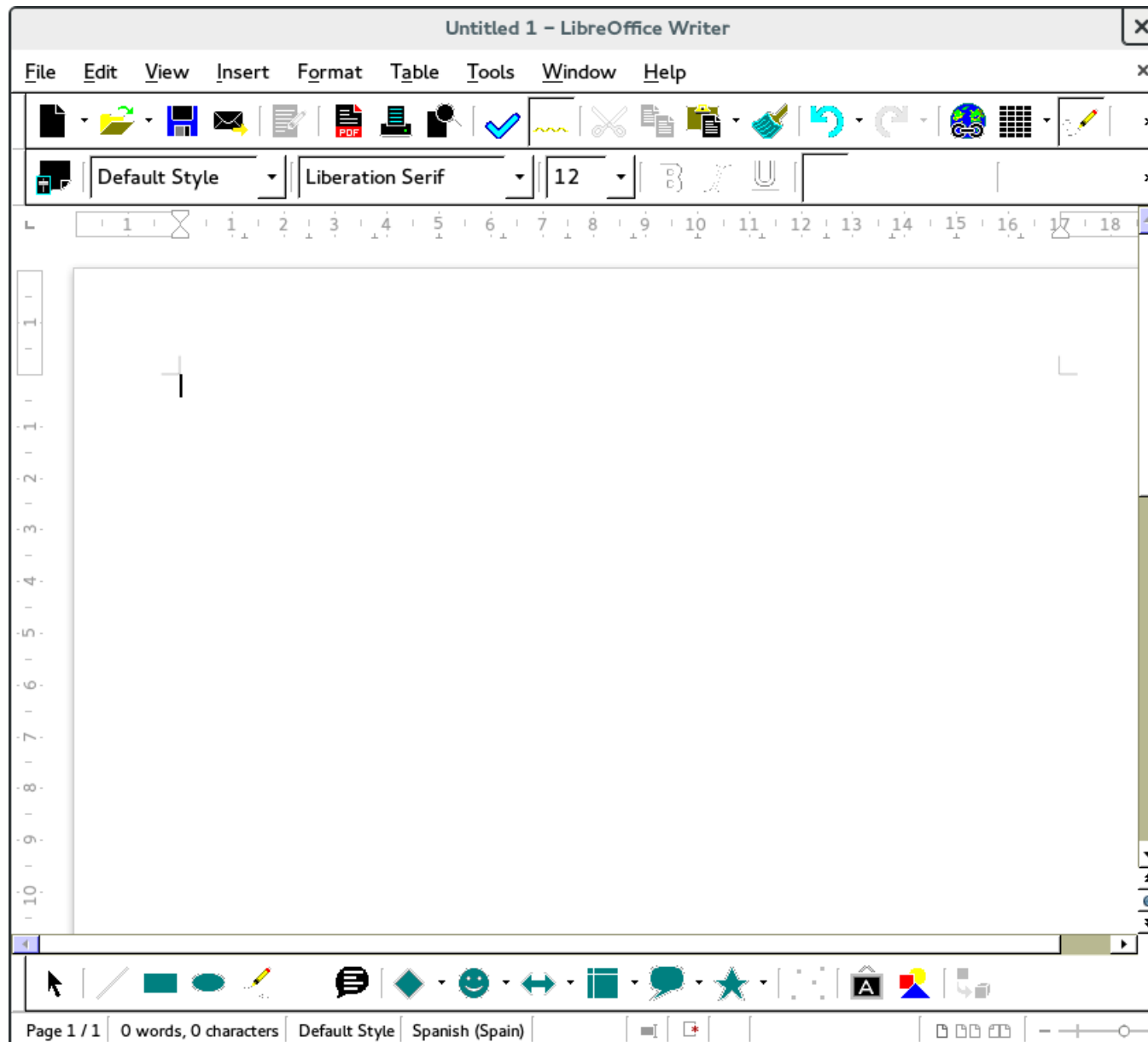
- Not a global, application-wide design
- Large parts of LibreOffice don't follow this pattern
 - Filters, VCL (visual components library)

LibreOffice accessibility

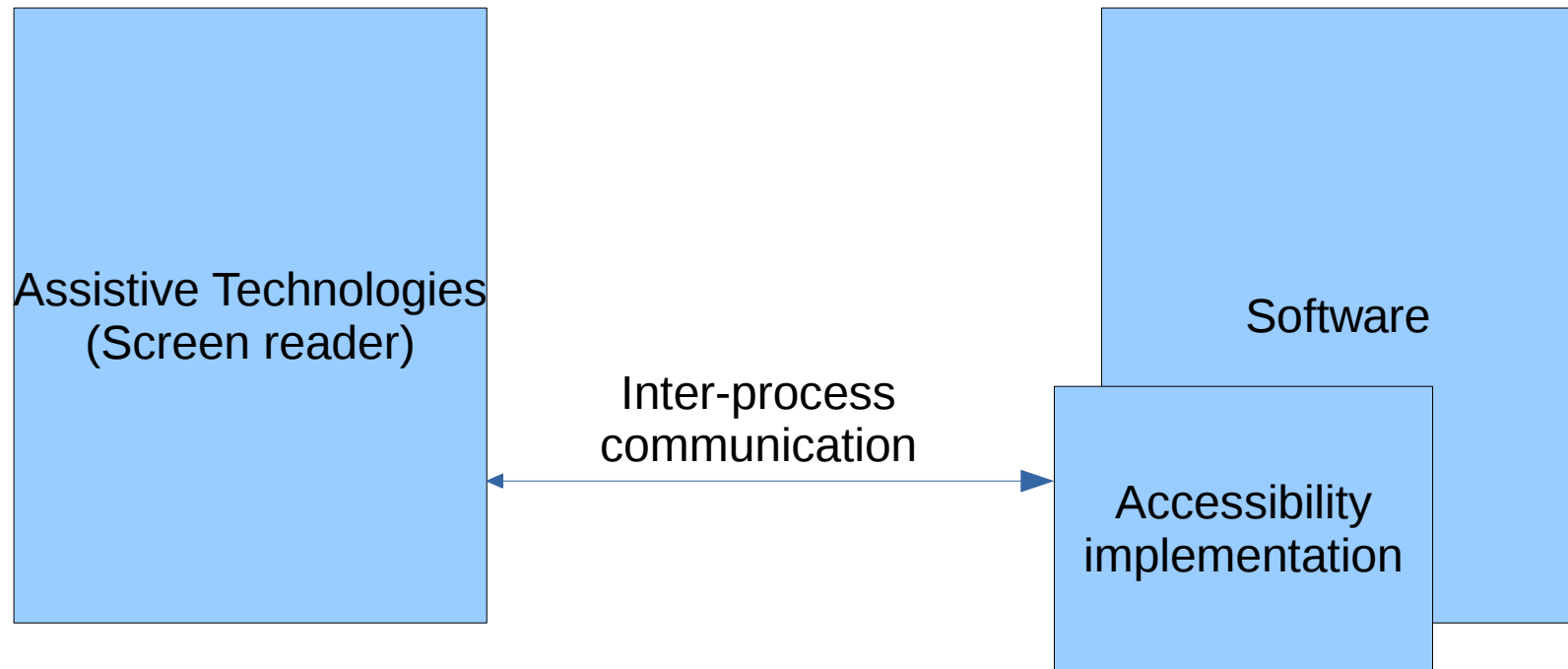
Some assistive technologies

- Hardware ATs
 - Adaptive input devices
- Software ATs
 - Magnifier
 - High contrast
 - Screen reader

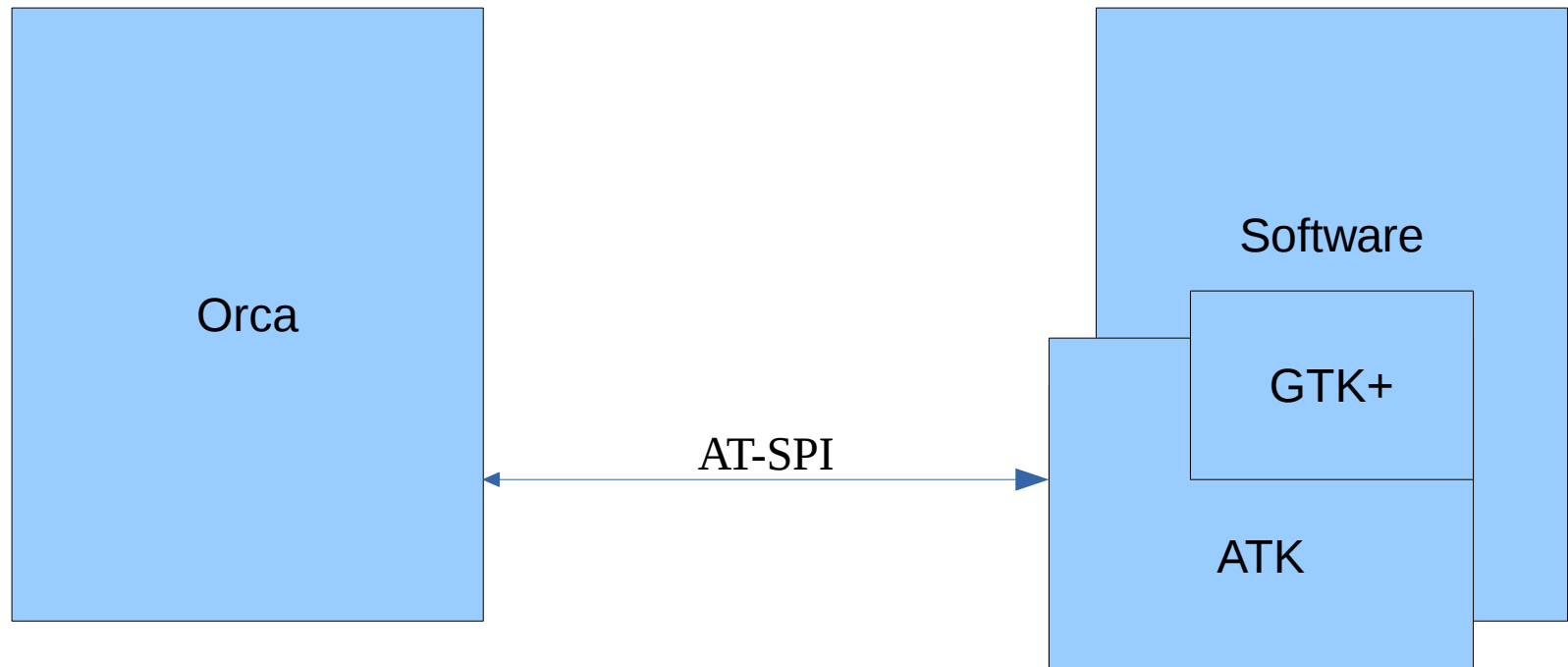
High contrast



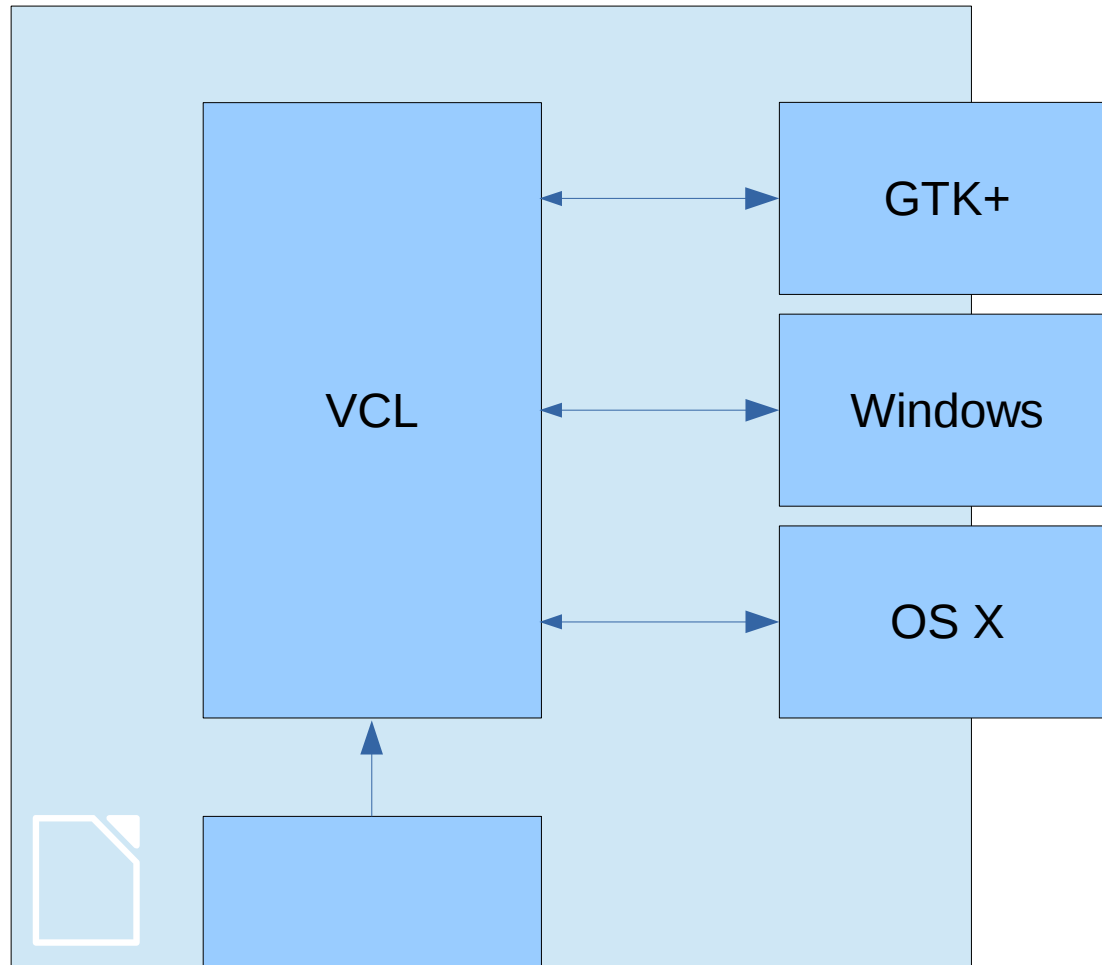
Screen reader



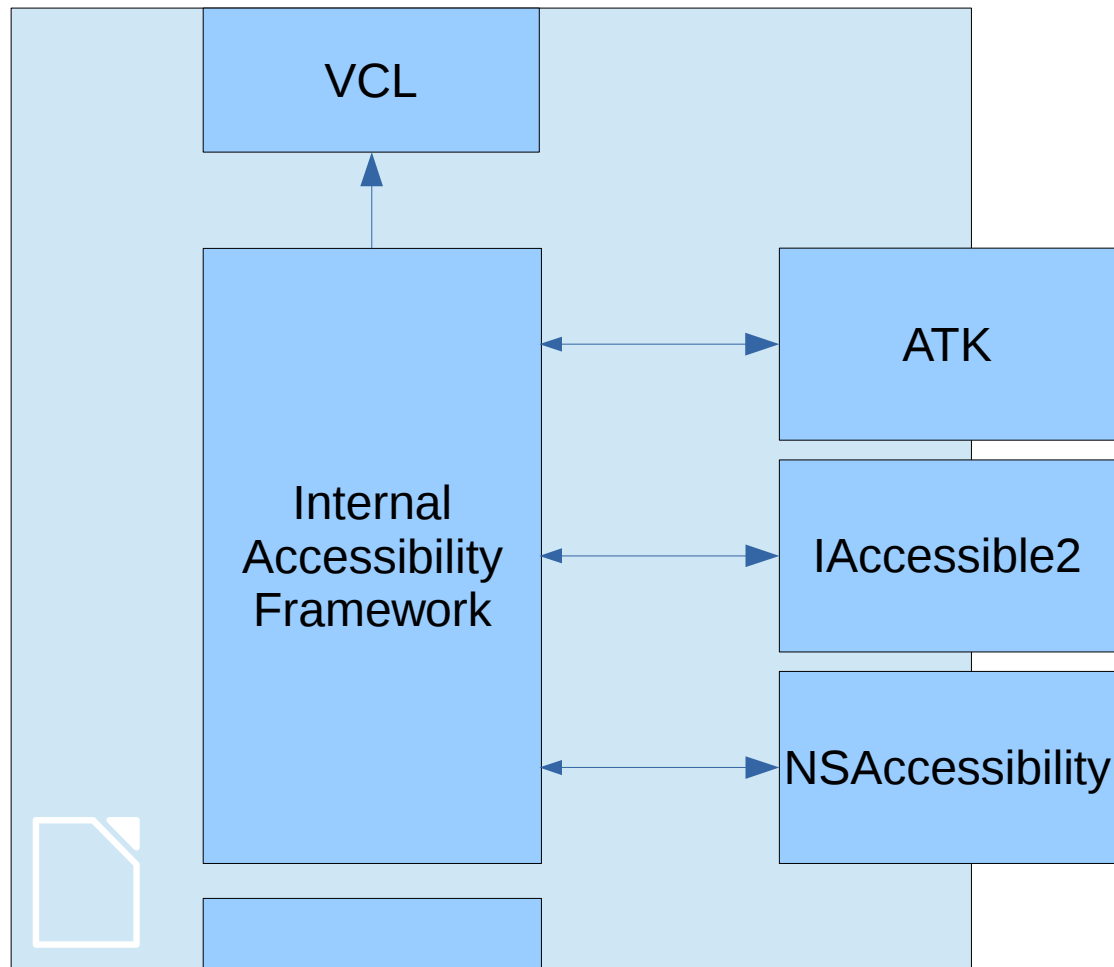
Screen reader (GNOME)



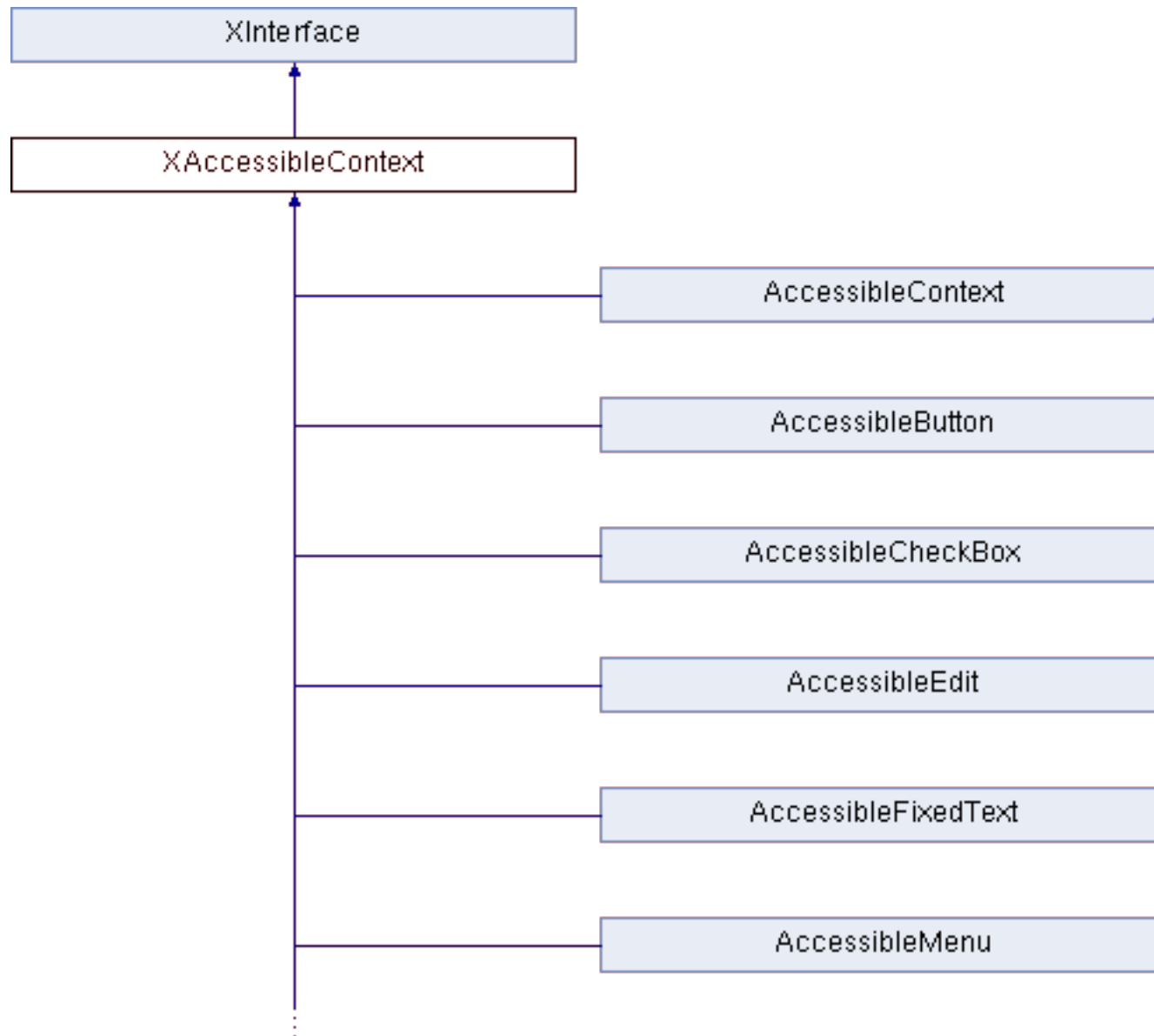
Architecture



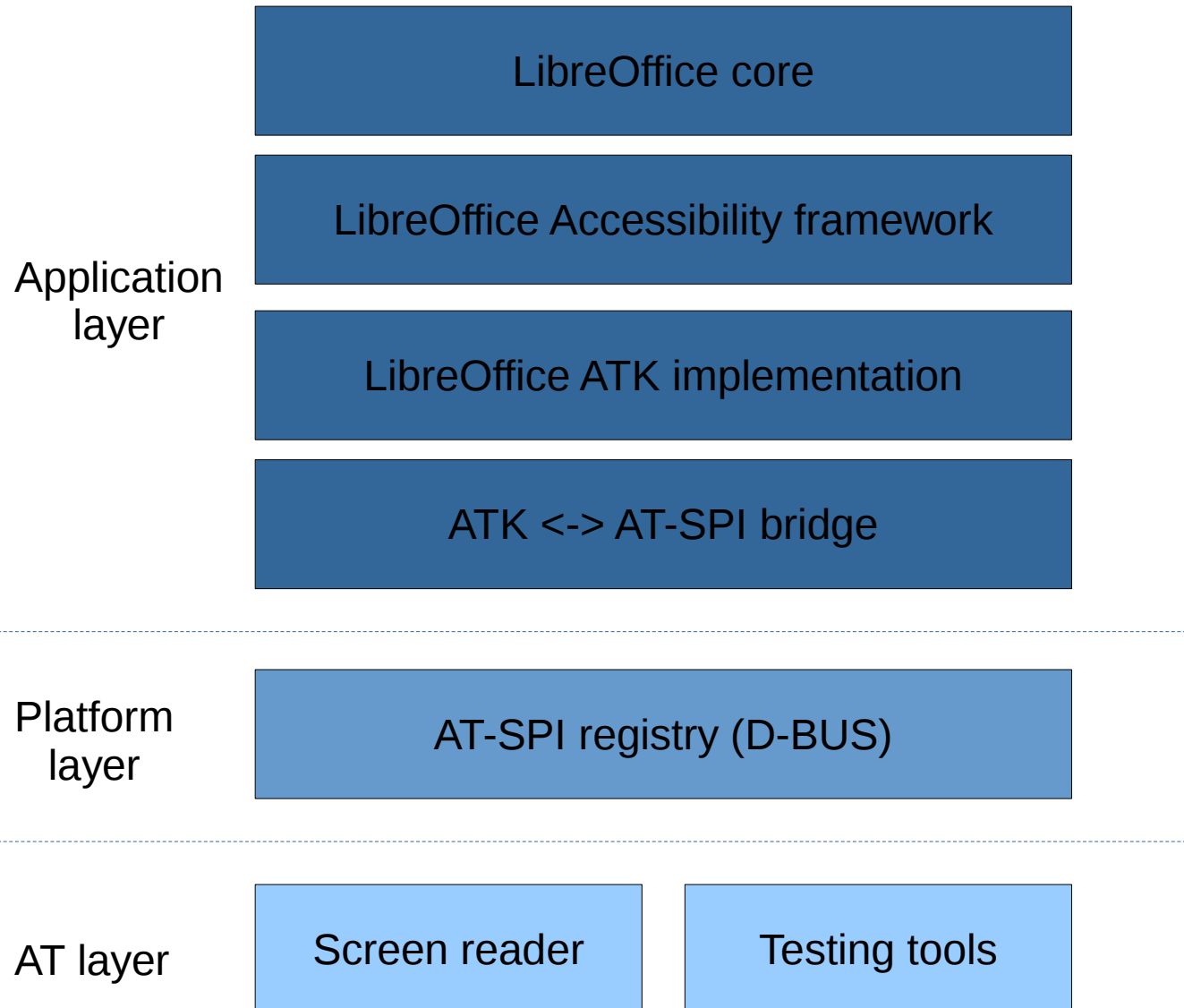
Architecture



Interfaces involved

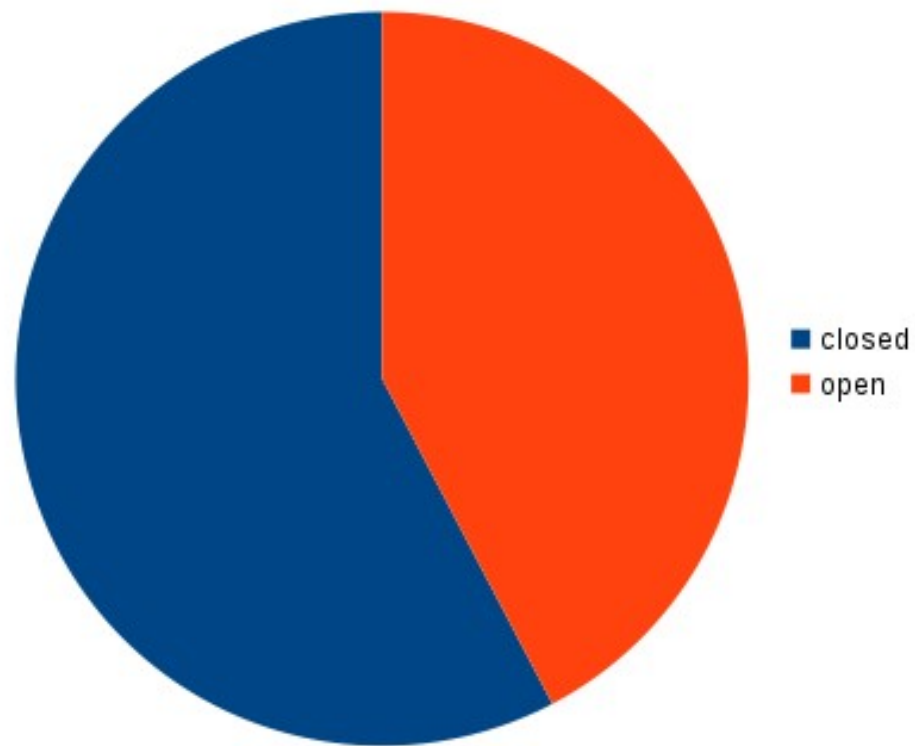


Layers



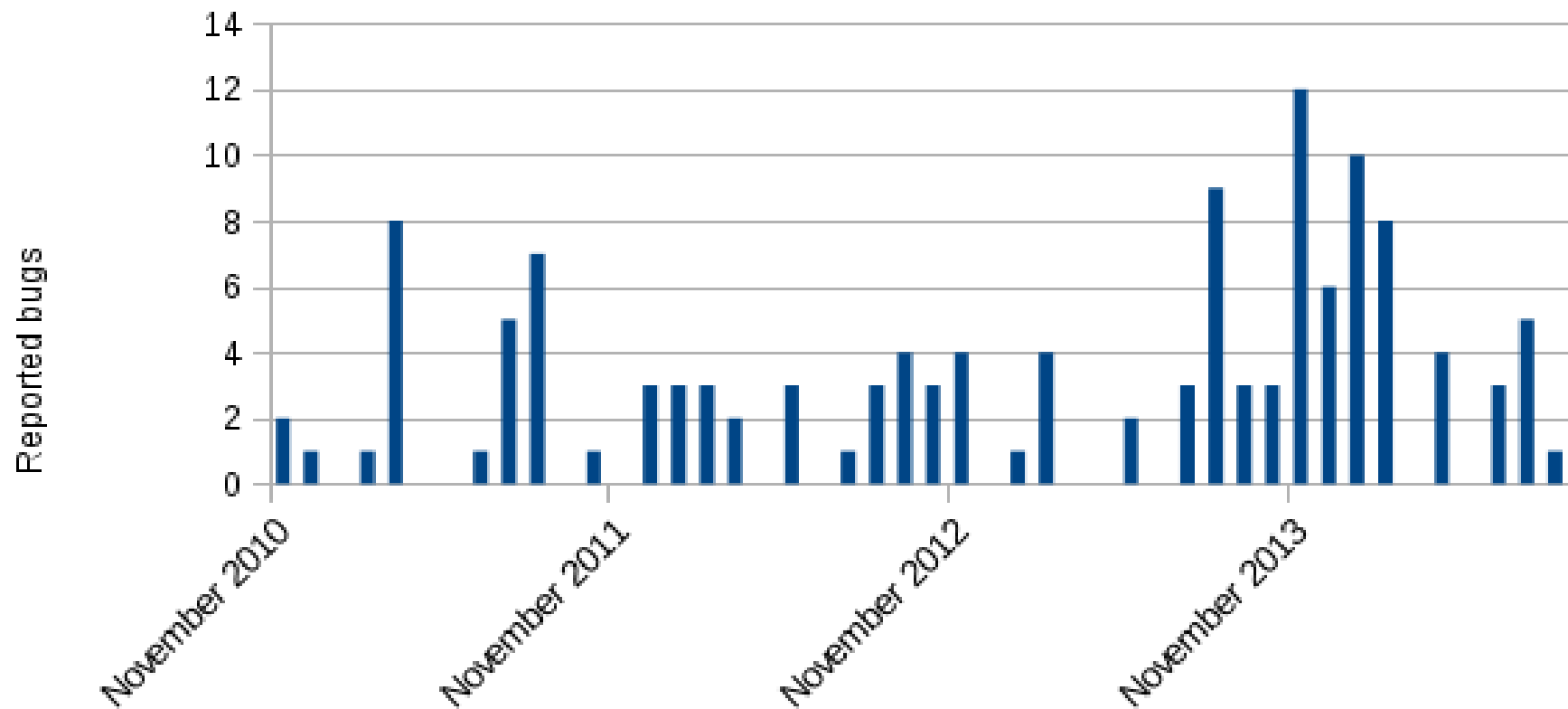
Bug metrics

- 130 bugs reported since November 2010
 - 55 open, 75 closed



Accessibility reports

Reported accessibility bugs per month



Current status

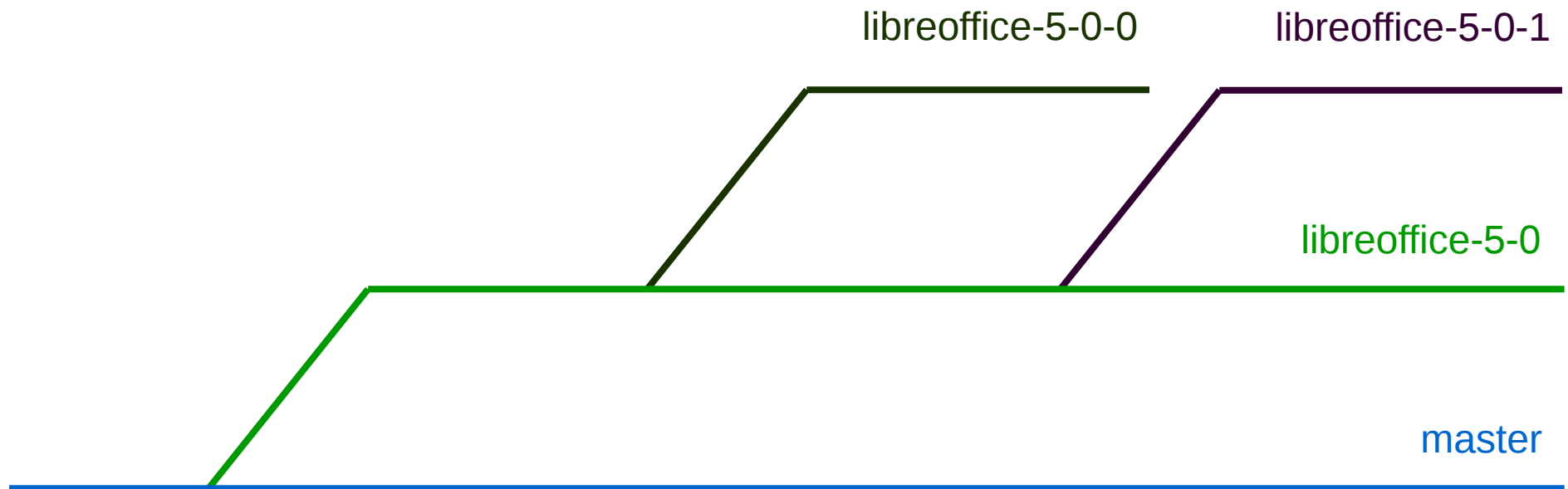
- It's been under real user for years
 - Reports increase, suggests an increase of users
- Of course, there are open bugs
 - Like in any software!
 - New reports are a symptom of good health

Quality assurance

Techniques and tools

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


Peer review



Peer review

- master branch
 - Committers without review, 1 review for others
- libreoffice-5-0 branch:
 - Only bugfixing
 - +1 review in any case
- libreoffice-5-0-x branches:
 - Only patches from 5-0 branch
 - +2 reviews

Peer review

Change 12213 by sushil_shinde **Review in Progress**  [Reply...](#)

Reviewers

CC [test_jenkins_mac](#)

Project [core](#)

Branch [master](#)

Strategy Cherry Pick

Updated 23 hours ago

Change-Id [I5d664867c982e48d2ff01363659282354822e541](#)

Topic

Code-Review

Verified

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.



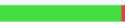
4) I have done same thing here and by doing this no existing unit test was failed.

5) Added unit test to check 'TextBreak' value for chart.

Change-Id: [I5d664867c982e48d2ff01363659282354822e541](#)

Files

Diff against: [Base](#)

| | 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

[Expand All](#)

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
- Different platforms
 - All supported platforms and some more (Android, iOS)
- Different compilation options

Continuous integration

[illegible]

Crashtests

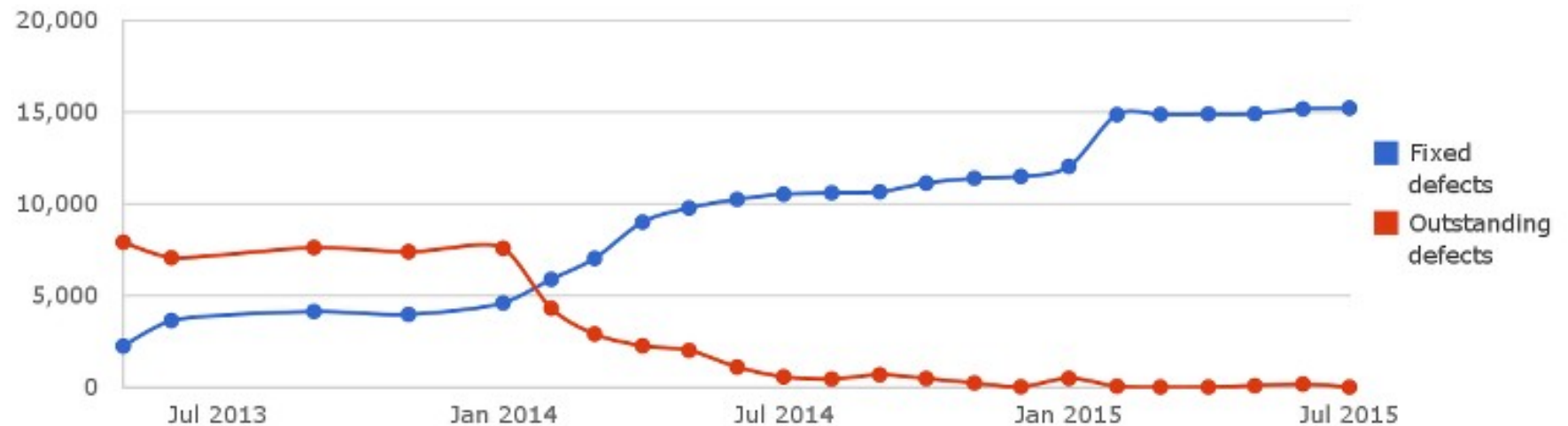
- Check crashes when opening and saving documents
- Sample size: 55000 documents
 - Most come from bug reports
- Periodicity: weekly

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

Outstanding vs Fixed defects over period of time



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!