

The Challenges of FLOSS Office Suites

Michael Meeks

CEO, Collabora Productivity

michael.meeks@collabora.com



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Online

“Stand at the crossroads and look; ask for the ancient paths, ask where the good way is, and walk in it, and you will find rest for your souls...” - Jeremiah 6:16





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Overview

Why Office is not easy

- The problem space is hard
- Backwards compatibility

Sustaining complex software

- Technology trends
- Deep legacy joys

Collaboration

- OT / CRDT vs. single model

User Experience

- What does the user want ?
- Data driven functional wins

New Features / functionality

New Collabora Office

Get Involved ...



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Office Documents ...

It seem easy: the browser can do that for free !??

Lets start with some text ...



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Font Metrics: the simple stuff ...

Proportionally spaced fonts:

- Look beautiful
- Are the majority of fonts

Proportional

Unicode is beautiful except for eg. Webdings

Monospace

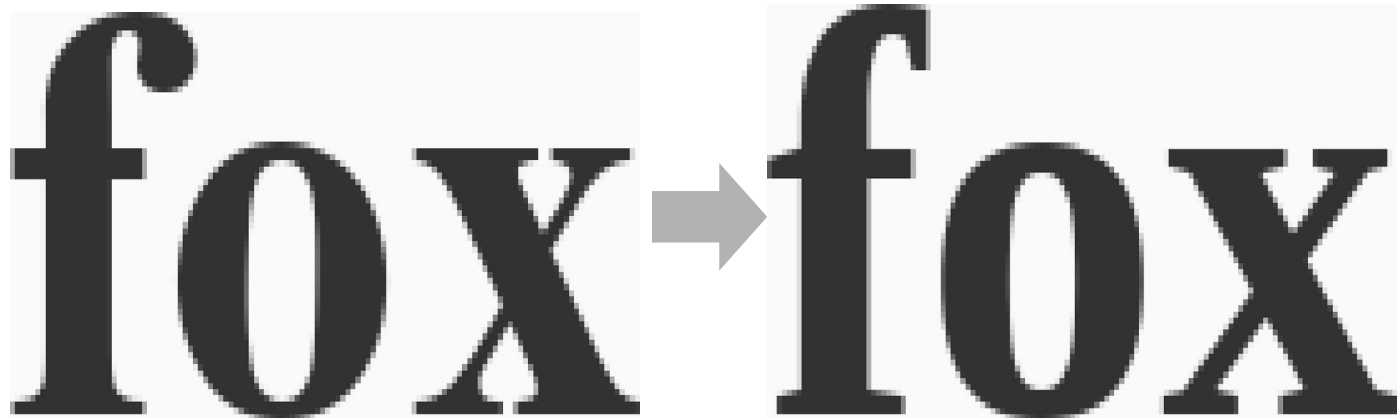




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Solution: metric Compatible Fonts

Reusing the same metrics for layout compatibility



And / or embedding fonts (cf. PDF font subsetting ...)



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More simple stuff: Right to Left ...

Screenshot of the LibreOffice Calc interface showing the ribbon menu and a spreadsheet grid.

The ribbon menu is in Arabic and includes the following tabs: **ملف** (File), **الصفحة الرئيسية** (Home), **إدراج** (Insert), **مُخطّط الصفحة** (Page Layout), **الصيغ** (Formulas), **بيانات** (Data), **مُراجعة** (Review), **تُسق** (Tools), and **عر** (Help).

The **الصفحة الرئيسية** (Home) ribbon is active, showing the following groups:

- Alignment**: Includes icons for text alignment (left, center, right, justified) and paragraph alignment (top, bottom, middle, bottom-top, top-bottom).
- Font**: Includes icons for font color, background color, font size (pt 10), font family (Lohit Devanagari), bold (B), italic (I), underline (U), and strikethrough (ABC).
- Clipboard**: Includes icons for paste, copy, and cut.

The spreadsheet grid shows columns labeled J, G, F, E, D, C, B, A, and a row labeled 21. The cell A21 contains the value 972. The formula bar shows the formula $= \sum f_x$ and the cell reference CQ1017.



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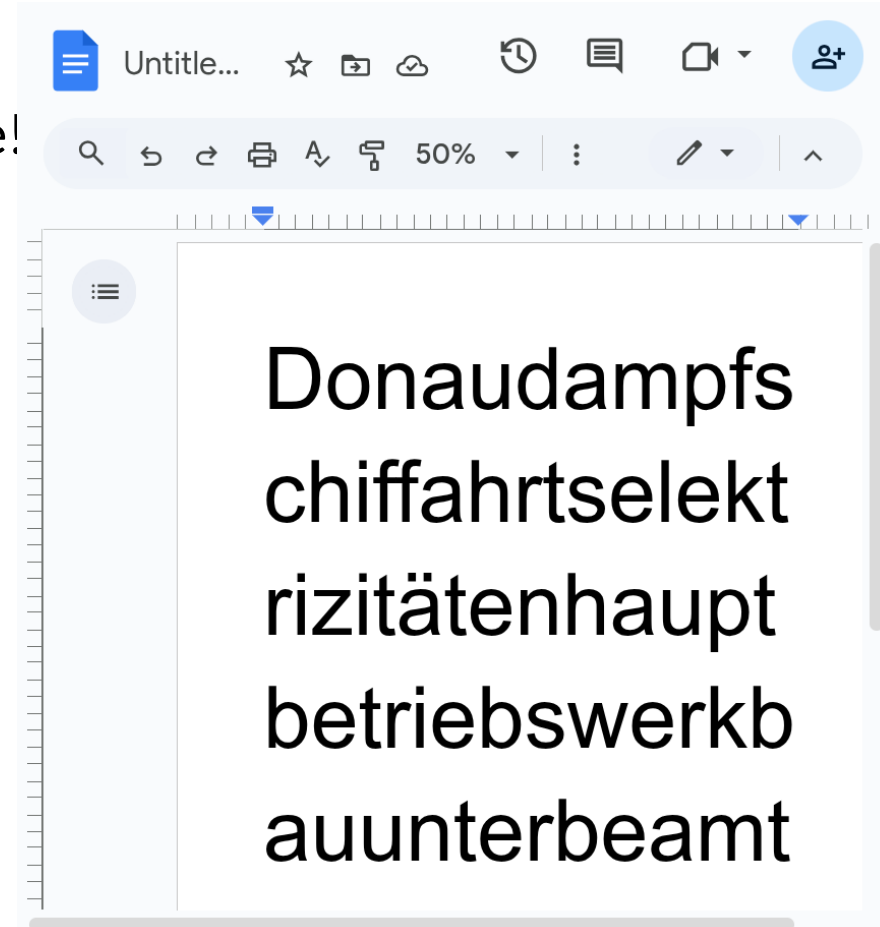
Writer layout complexities

Simple layout loops:

- We have more space on the page!
- Lets include the next paragraph
- That brings a footnote / image
- That re-sizes the page
- Lets break the Para to see if we can get part of it ?

Getting worse:

- Auto-hyphenation
- Smart justification etc. ...





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Complex Text: text-grid, ruby text ...



Ruby: not just a programming language

Hiragana	Katakana	Romaji
とうきょう 東京	トウキョウ 東京	Tō kyō 東京

<https://www.w3.org/TR/jlreq/?lang=en>

<div> vs. HTML Canvas ...



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Print ? – leave it to the browser !?

Well, sort of ...

- `Window.print()`
- “Have a PDF, will travel” `.open()?.print?().`

Do I have a printer ?

- Browser has no idea! – (fear of **Finger-Print-ing** ?)

What paper size is it ?

- still no idea.

Good thing we used the canvas to render (!?)

- Now we can handle all complex text & also render to PDF ...



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Spreadsheets: scale ... 64bit ZIPs ...

Data storage: sparse data

- just *"iterate all the cells"*
 - 16k columns (2^{14}) * 1m rows (2^{20}) → 2^{34} possible cells

old: vector of ColEntry { int row; ScBaseCell *cell_ptr }

- Madness – but interpolation search: $O(\log(\log(n)))$

new: { int start, int length, union { double d[], string s[] } } - ONO cf. mdds

- Bisection search $O(\log(n))$ – flat-memory, SIMD arithmetic etc.

Or: Javascript - Sparse arrays → hash_table on array index ...

ZIPs of 64bit size streamed

- $O(1)$ XML parser to handle the big files

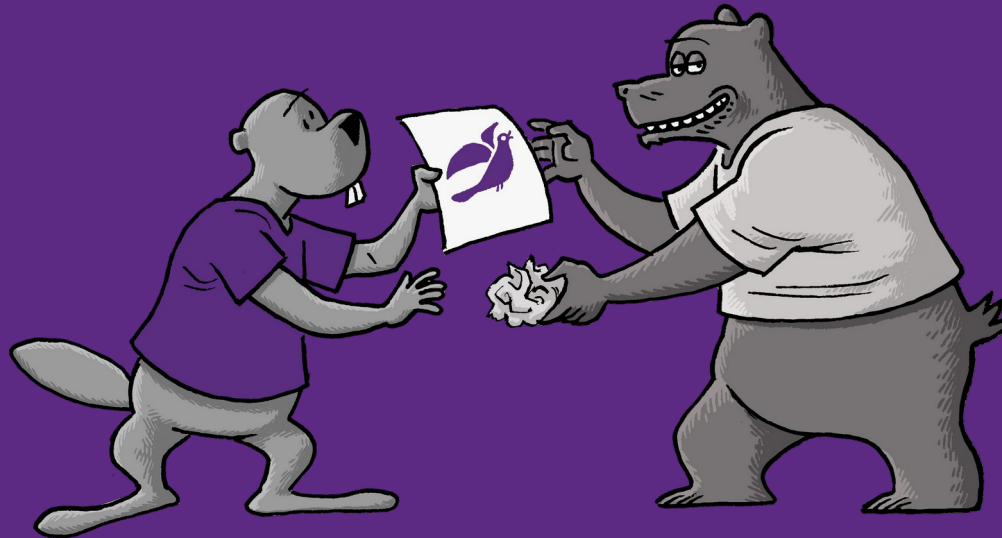


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Compatibility / interoperability

Trillions of existing documents out there ...

↖
a real number,
not rhetorical
excess





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Example – Interop Problem

10.5.2016 OB 9:30 – na CSD TIM, soba 326 – Silvana ŠAŠIVARIJA

27.5.2016 OB 14:00-16:00 DELAVNICA ZA REJNIŠTVO

3.5.2016, torek

Collabora's layout test:
Black → matching pixels
Red → mis-matching pixels

Ime in priimek	Pričetek	Ure	Šifra	Izvajalec	Kratek opis in opazanja
				Simona MARTINČEK	DDPST
	10:00-14:00	44	4000	Ana Marija RIBIČAR	Čiščenje prostorov.
Luka OVRČEC	10:00-11:00	11	11	Alen SELA	Pogovor o prvotnih praznikih in pomoč pri kopiranju strani iz USB ključka.
Tadej GAČNIK	11:00-13:00	22	11	Alen SELA	Individuálni sestanki. Povejda o lab pomoč pri predmetih MAT, SDO in KEMD. Delavci dolžni imajo matematične vajet, češtinami njegovo znanje.
Lilijana ČERNIČ	13:00-14:30	1,5	11	Alen SELA	Pogovor z Lilijano Černič in Marcel Leibl. Tema o telefoniranju in načinu komunikacije preko spleta. Tudi kako bi se našli z dnevom brez telefonov.
	14:00-14:30	0,5	204	Mateja ČEH Sara IBIS Manuela KORAČ	Intervjuja - pogovor o preživljanju počitnic v PKI, dejavnostih in dogodkih.
Marcel Leibl	14:30-15:30	11	55	Sara IBIS Mateja GAČNIK	Izgrajenje računalniškega sistema in pogovor o uporabi telefona.
	14:30-15:00	0,5		Manuela KORAČ	
Tjasa OZIERL	14:30-15:30	11	44	Alen SELA	Pomoč pri učenju ANGLŠČINE in angleškihiger.
Daša OČIČ	14:30-15:30	11	44	Mateja ČEH	Pomoč pri reševanju preteklih pri ZGO. Nazadnje je sodelovala, a ji je nekaj malopazila koncentracija. Čakal je, da ji poiskemo odgovore.
Jessica BIDLICER	15:30-16:30	11	44	Sara IBIS	Vdajanje MAT za NPZ, ki ga piše naslednji dan. Večinoma primerov ima že rešenih zato na koncu pregledam, koliko oči je izbral in ugotovim, da se je zelo dobro odrezala.
Xhenete KRASNIČ	15:00-18:00	33	44	Manuela KORAČ	Napisati timorata analizo domačega brajaja (Tonč Pavček/Marinca) Obe dobro sodelujeta in ista motivirani. Xhenete je velik naredila žel doma, tako da dolžna se stvari dopolniti. Leonita ni imela knjige, tako da je moral vsi narediti od začetka. Veliko prepisuje od Xhenete. Vdajanje je sproščeno pogovarjata se o dogodkih iz šole, kakor imata strogo očetek kakšno sobjo bezenske zadave primolčanitih.
Daša OČIČ	15:30-17:00	1,5	44	Mateja GAČNIK	Učenje ZGO odgovorja na prajanja iz delovnega lista.
Miran KACIČNIK	15:30-16:30	11	44	Mateja ČEH	Utrjevanje snovi za usto preverjanje z najprijavnimi. Predelava sva delotno snovi in se dogovorila da bova po potrebi sredila v četrtel 55 52 046.

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Example – Interop Problem

10.5.2016 OB 9:30 – na CSD TIM, soba 326 – Silvana ŠAŠIVARIJA

27.5.2016 OB 14:00-16:00 DELAVNICA ZA REJNIŠTVO

Fixed: compat12 → compat15

3.5.2016, torek

Ime in priimek	Prisotnost	Ure	Šifra	Izvajalec	Kratek opis in opažanja
				Simona MARTINŠEK	DOPUST
	10:00-14:00	4	400	Ana Marija RIHTARŠIČ	Čiščenje prostorov.
Luka LOVREC	10:00-11:00	1	1	Alen ŠELA	Pogovor o prvomajskih praznikih in pomoč pri kopiranju strani iz USB ključka.
Tadej GAČNIK	11:00-13:00	2	1	Alen ŠELA	Individualni sestanek. Pove, da rabi pomoč pri predmetih MAT,SLO in KEM. Delava določene matematične vaje, testiram njegovo znanje.
Lilijana ČERNČIČ Marsel LEIBL	13:00-14:30	1,5	1	Alen ŠELA	Pogovor z Lilijana Černčič in Marsel Leibl. Tema so telefoni in način komunikacije preko spleta. Tudi kako bi se testirali z dnevom brez telefonov.
	14:00-14:30	0,5	204	Mateja ČEH Sara FLIS Manuela KORADE	Intervizija – pogovor o preživljanju počitnic v PIKI, dejavnostih in dogodkih.
Marsel LEIBL Alex ČEH	14:30-15:30	1	5	Sara FLIS Mateja GAIŽLER	Igranje ročnega nogometa in pogovor o uporabi telefona.
	14:30-15:00	0,5		Manuela KORADE	
Tjaša CIZERL	14:30-15:30	1	4	Alen ŠELA	Pomoč pri učenju ANG, igranje angleških iger.
Daša JOCIČ	14:30-15:30	1	4	Mateja ČEH	Pomoč pri reševanju predtesta pri ZGO. Na začetku je sodelovala, a ji je kmalu padla koncentracija. Čakala je, da ji poiščem odgovore.
Jessica HEDLER	15:30-16:30	1	4	Sara FLIS	Vadiva MAT za NPZ, ki ga piše naslednji dan. Večino primerov ima že rešenih, zato na koncu pregledam, koliko točk je zbrala in ugotovim, da se je zelo dobro odrezala.
Xheneta KRASNIČI Leonita REXHA	15:00-18:00	3	4	Manuela KORADE	Napisati morata analizo domačega branja (Tone Pavček, Majnice). Obe dobro sodelujeta in sta motivirani, Xheneta je veliko naredila že doma, tako da določene stvari dopolniva. Leonita ni imela knjige, tako da je morala vse narediti od začetka. Veliko prepisuje od Xhenete. Vzdušje je sproščeno, pogovarjata se o dogodkih iz šole, kako imata stroge očete, kakšne so ljubezenske zadeve pri muslimanih.
Daša JOCIČ	15:30-17:00	1,5	4	Mateja GAIŽLER	Učenje ZGO, odgovarjanje na vprašanja iz delovnega lista

// tdf#164201 the table was shifting to left of the page margin because it became compat12

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Huh ? version-based layout locking

OOXML: be compatible with ...

- `<w:name="compatibilityMode"/>`
- Locking the document to a specific Word layout engine.

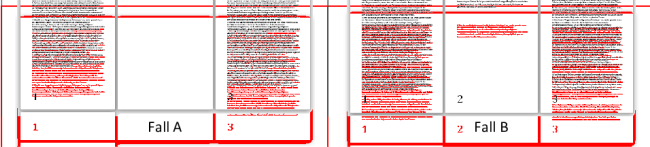
w:val	Meaning
11	Word 2003
12	Word 2007
14	Word 2010
15	Word 2013
16	Word 2016+

Abschnitt 1 Seite 1

Abschnittswechsel Ungerade Seite

Das Einfügen eines Seitenumbruchs mit der Option "Ungerade Seite" hat zwei "Normalfälle":

Das Einfügen eines Seitenumbruchs mit der Option "Ungerade Seite" hat zwei "Normalfälle":



Fall A

Fall A

Fall B

Fall A Der erste Abschnitt mit einer ungeraden Seite endet, dann wird eine leere, nicht nummerierte Seite zwischen geschoben und die erste Seite im neuen Abschnitt bekommt die nächste fortlaufende ungerade Zahl. Wenn der erste Abschnitt mit einer ungeraden Seite endet, dann wird eine leere, nicht nummerierte Seite zwischen geschoben und die erste Seite im neuen Abschnitt bekommt die nächste fortlaufende ungerade Zahl.

Fall B

Fall B Der erste Abschnitt mit einer geraden Seite endet, dann wird einfach eine neue Seite aufgemacht und die Seitennummerierung läuft ganz normal weiter. Wenn der erste Abschnitt mit einer geraden Seite endet, dann wird einfach eine neue Seite aufgemacht und die Seitennummerierung läuft ganz normal weiter.

Spezialwunsch und Spezialproblem

Die Seitenzahl im zweiten Abschnitt soll auf jeden Fall mit 1 beginnen, und zwar auf einer - bei normaler Zählung - ungeraden Seite. Stellt man bei SEITENZAHL FORMATIEREN ein: BEGINNEN BEI 1 so ein, gibt es den Fall A nicht mehr, denn dann folgt wunschgemäß auf eine ungerade Seite eine ungerade Seite, auch wenn bei normaler Zählung eine gerade Seite folgen würde. Deshalb wird in keinem Fall ein leeres Blatt ausgegeben. Dann folgt wunschgemäß auf eine ungerade Seite eine ungerade Seite, auch wenn bei normaler Zählung eine gerade Seite folgen würde. Deshalb wird in keinem Fall ein leeres Blatt ausgegeben.

Die Lösung ist etwas aufwändig. Ihr Trick besteht darin, dass man bei SEITENZAHLN FORMATIEREN den neuen Abschnitt nicht bei Seite 1 beginnen lässt, sondern die Seitenzahl ganz normal weiterlaufen lässt. Stattdessen wird der neue Beginn bei 1 durch eine Berechnung realisiert. Word hantiert dann aber intern mit der fortlaufenden Seitenzahl weiter. In der Berechnung wird die Gesamtseitenzahl des ersten Abschnittes erfasst und davon die aktuelle Seitenzahl des zweiten Abschnitts abgezogen, so dass rechnerisch die erste Seite des zweiten Abschnitts mit 1 beginnt.

Die Lösung Schritt für Schritt

Die Lösung Schritt für Schritt

Seitenzahlen

Die Seitenzahlen sollen über die Abschnitte hinweg erst mal weiterlaufen:
Die Seitenzahlen sollen über die Abschnitte hinweg erst mal weiterlaufen.

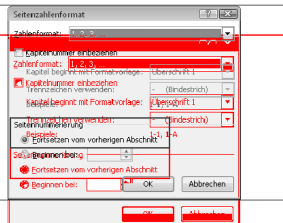
KOPF- UND FÜßZEILENTOOLS > SEITENZAHLN >

SEITENZAHLN FORMATIEREN >

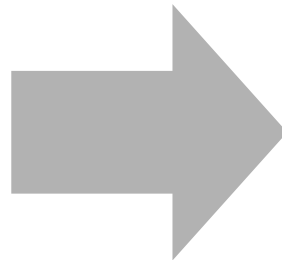
FORTSETZEN VOM VORHERIGEN ABSCHNITT

SEITENZAHLN FORMATIEREN >

FORTSETZEN VOM VORHERIGEN ABSCHNITT



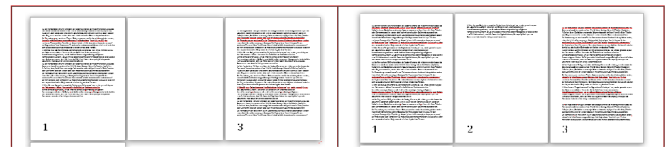
Layout is not standardized.



Here a vertical offset issue fixed.

Abschnittswechsel Ungerade Seite

Das Einfügen eines Seitenumbruchs mit der Option "Ungerade Seite" hat zwei "Normalfälle":



Fall A

Fall B

Fall A

Wenn der erste Abschnitt mit einer ungeraden Seite endet, dann wird eine leere, nicht nummerierte Seite zwischen geschoben und die erste Seite im neuen Abschnitt bekommt die nächste fortlaufende ungerade Zahl.

Fall B

Wenn der erste Abschnitt mit einer geraden Seite endet, dann wird einfach eine neue Seite aufgemacht und die Seitennummerierung läuft ganz normal weiter.

Spezialwunsch und Spezialproblem

Die Seitenzahl im zweiten Abschnitt soll auf jeden Fall mit 1 beginnen, und zwar auf einer - bei normaler Zählung - ungeraden Seite.

Stellt man bei SEITENZAHL FORMATIEREN ein: BEGINNEN BEI 1 so ein, gibt es den Fall A nicht mehr, denn dann folgt wunschgemäß auf eine ungerade Seite eine ungerade Seite, auch wenn bei normaler Zählung eine gerade Seite folgen würde. Deshalb wird in keinem Fall ein leeres Blatt ausgegeben.

Lösung

Die Lösung ist etwas aufwändig. Ihr Trick besteht darin, dass man bei SEITENZAHLN FORMATIEREN den neuen Abschnitt nicht bei Seite 1 beginnen lässt, sondern die Seitenzahl ganz normal weiterlaufen lässt. Stattdessen wird der neue Beginn bei 1 durch eine Berechnung realisiert. Word hantiert dann aber intern mit der fortlaufenden Seitenzahl weiter.

In der Berechnung wird die Gesamtseitenzahl des ersten Abschnittes erfasst und davon die aktuelle Seitenzahl des zweiten Abschnitts abgezogen, so dass rechnerisch die erste Seite des zweiten Abschnitts mit 1 beginnt.

Die Lösung Schritt für Schritt

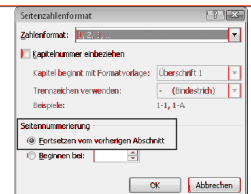
Seitenzahlen

Die Seitenzahlen sollen über die Abschnitte hinweg erst mal weiterlaufen:

KOPF- UND FÜßZEILENTOOLS > SEITENZAHLN >

SEITENZAHLN FORMATIEREN >

FORTSETZEN VOM VORHERIGEN ABSCHNITT



EMF+ - my graph!

That 'graph' is a Windows API dump

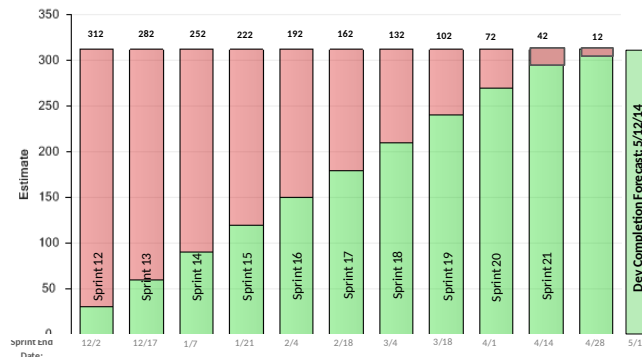
- [Windows-Meta-File](#) (WMF) + EMF, EMF+

Backwards-compatible:

- Dual renderings
 - Extended-Meta-File+ hides in 'comments'
- Win16 API onwards here, XOR rendering, 1bit masks ...
- OLE embedded object previews a speciality.
- *"The native vector format for MS Office"*

Extended over time:

- **PASSTHROUGH** - Passes through arbitrary data to the printer driver.
- **POSTSCRIPT_DATA** - Sends arbitrary PostScript data to the output device.





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A much loved codebase ...

sc/source/core/data

lines	filename
6961	document.cxx
1548	documen2.cxx
2200	documen3.cxx
1386	documen4.cxx
655	documen5.cxx
210	documen6.cxx
615	documen7.cxx
1328	documen8.cxx
686	documen9.cxx
1182	document10.cxx

Why is it split into 10 filenames ?

OS/2 – (went 32bit before Windows ...)

16bit token limit for
compiler tokens

30 years later – still like that ...



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Smart-art ! ... “Diagram” bits

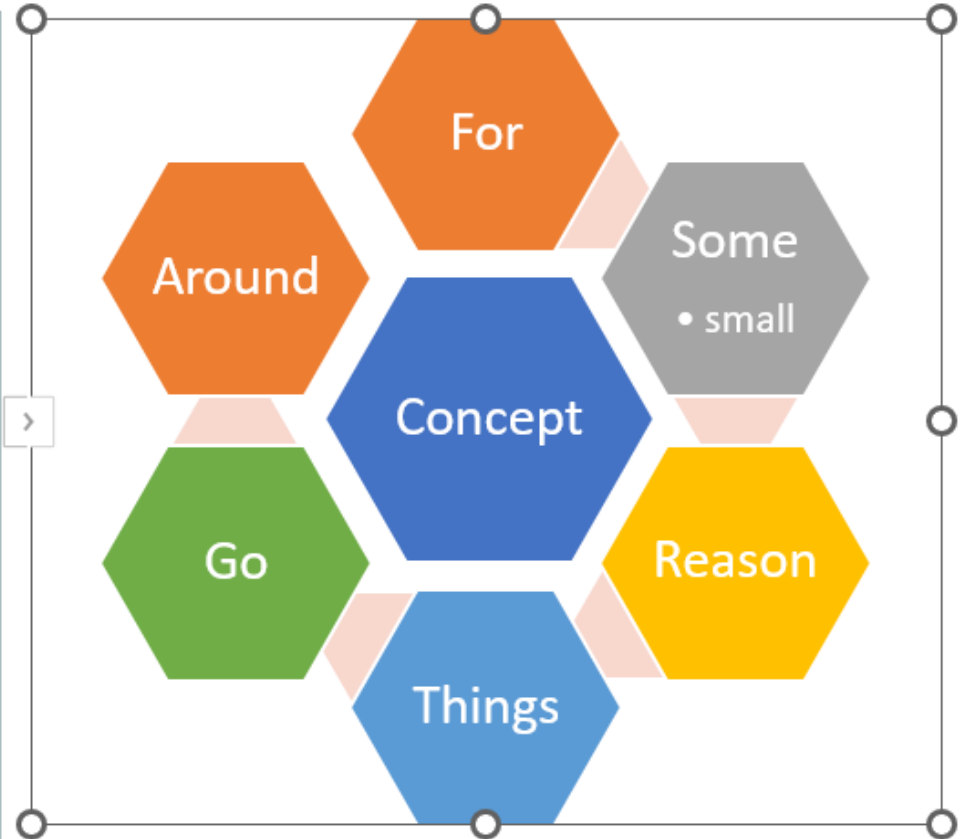
Type your text here

- Concept
 - For
 - Some
 - small
 - Reason
 - Things

Hexagon Radial

Use to show a sequential process that relates to a central idea or theme. Limited to six Level 2 shapes. Works best with small amounts of text. Unused text does not appear, but remains available if you switch layouts.

[Learn more about SmartArt graphics](#)



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Smart-art ! ... “Diagram” bits

XML spec - hundreds of (abbreviated terms)

- Very little documentation

Constraint solver / shape layout language:

```
<dgm:if name="Name48" func="var" arg="dir" op="equ" val="norm">
  <dgm:constrLst>    <!-- Constraint List ? -->
    <dgm:constr type="primFontSz" for="ch" ptType="node" op="equ" val="65"/>
    <dgm:constr type="w" for="ch" forName="quadrant1" refType="w" fact="0.433"/>
    <dgm:constr type="h" for="ch" forName="quadrant1" refType="h" fact="0.433"/>
    <dgm:constr type="b" for="ch" forName="quadrant1" refType="h" fact="0.5"/>
    <dgm:constr type="bOff" for="ch" forName="quadrant1" refType="h" fact="-0.01"/>
    ... omit ~20 constraints ...
  </dgm:if>
  <dgm:else name="Name49">
    ... omit 700+ lines ...
```




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**“We do these things not
because they are easy,

but because we thought
they would be easy”**

Ignorance is bliss. But ... a plague
of new, simplified Office suites: not so much



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Cascade of Attention Deficit Teens

The CADT development model ...

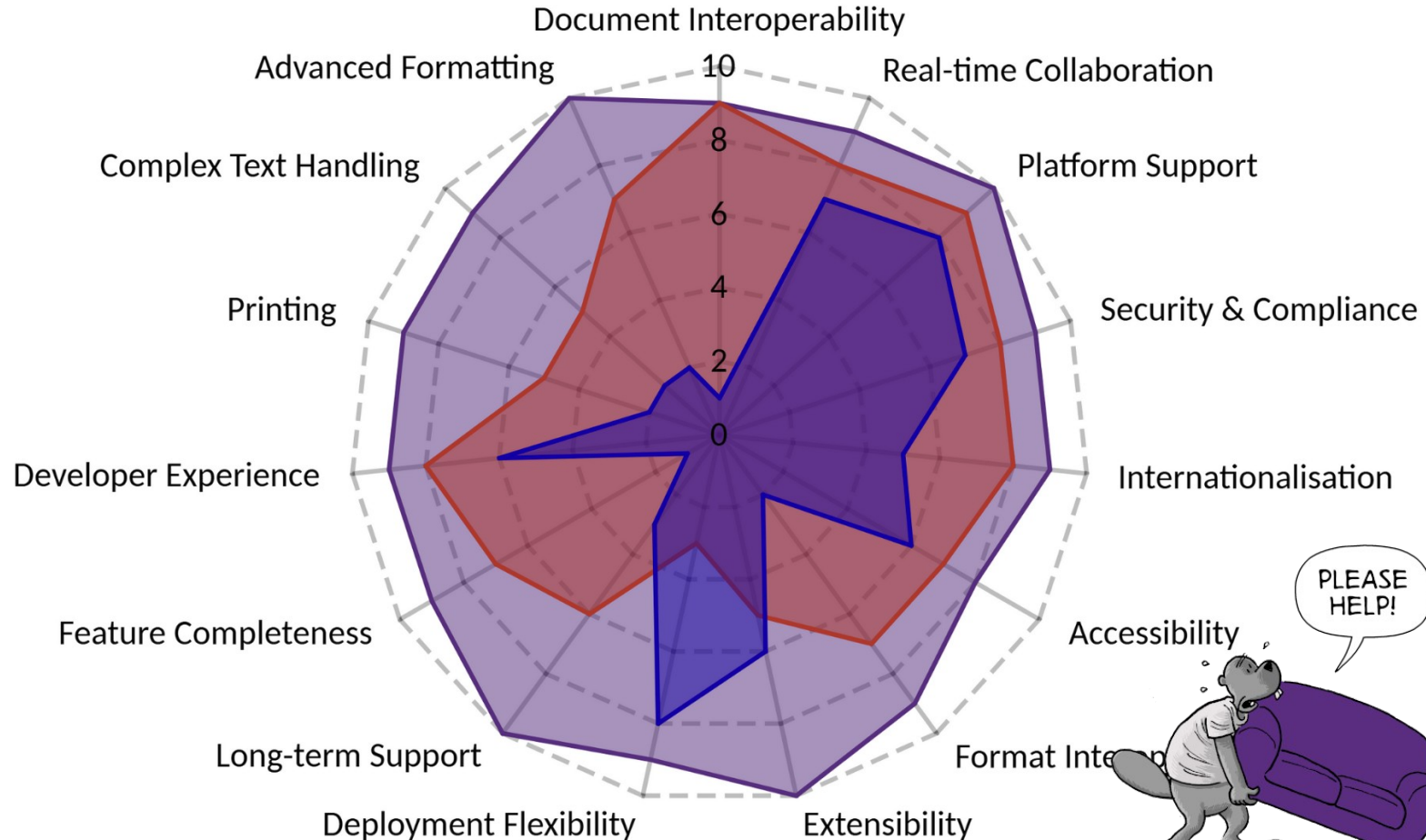
- Thanks to [Jamie Zawinski](#) unnervingly ~accurate cynicism
 - Real engineering is hard
- ***“It hardly seems worth even having a bug system if the frequency of from-scratch rewrites always outstrips the pace of bug fixing. Why not be honest and resign yourself to the fact that **version 0.8** is followed by **version 0.8**, which is then followed by version 0.8?” ...***
- ***“Fixing bugs isn't fun; going through the bug list isn't fun; but rewriting everything from scratch is fun (because “this time it will be done right”, ha ha) and so that's what happens, over and over again.”***

When cute naivety meets the quest for personal glory (?)



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Software is hard: Office more so ...





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But collaboration ! ...

Just re-write it all – in Java,
with OP transforms or CRDT ...





Smart people say: re-write it in ...

*"We encourage the OpenOffice group to quickly build their version of a spread sheet or a word app using **JavaFX**," said **Larry Ellison***

https://www.theregister.com/2009/06/04/ellison_javafx_commitment/



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Much simpler re-factor: UX win ... #1

Backending the new layout dialogs to native widgets:

- 1260+ glade-style XML 'ui' description files - 600k lines.

```
include/vcl/builder.hxx
```

Author: Caolán McNamara <caolanm@redhat.com>

Date: Mon **Mar** 26 12:15:22 **2012** +0100

```
bootstrap a ui-previewer for rendering  
GtkBuilder xml with vcl widgets
```

Author: Caolán McNamara <caolanm@redhat.com>

Date: Tue **Aug** 26 15:56:30 **2014** +0100

Dialogs no longer loaded from resource files.

**Multiple
person years
of the #1
developer +
helpers.**



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Operational Transforms ...



Popularized by Google Wave - 2009 - 2012

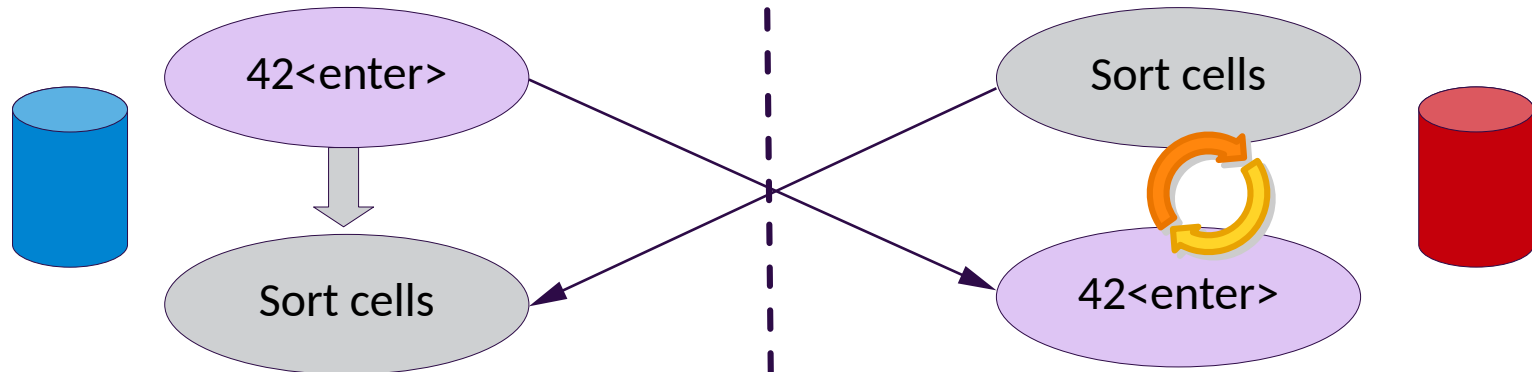
- Sent to Apache Wave → died 2018.

Re-write everything get 'undo' for free !

- Except - undo is already quite easy ...

Things to consider:
dependency chains,
INDIRECT,
asynchronous
calculation, random-
numbers, external data
sources, ***num-ops²***
programmer time

Spreadsheet Example



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Conflict-free Replicated Data Types

The latest fashion

- Ideal for very simple flat text ... (perhaps markdown?)

Real documents:

- Files are a ZIP file-system
 - With embedded XML trees ~millions of nodes
 - Lots of implicit invariants / cross-tree linking
- Could it be done ?
 - JSON tree magic ...
 - GUIDs to manage and track structure

Nightmare for file-formats

- Where do you keep your extra GUIDS ? Nevermind all state to date ...



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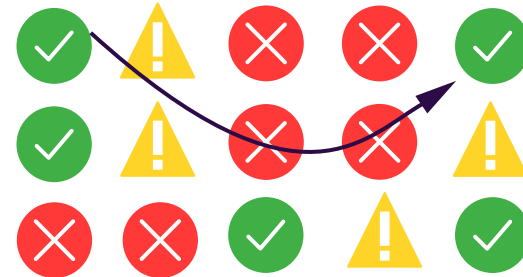
Conflicting constraints ...

Simple example: table cells

- You can set a minimum cell height – “*Must be **at least this big***”
- You can change the page size – “*I want to print on A6 paper*”

Our state space is more like this:

- Beware of invalid states
- Try to correct to adjacent valid ones





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Much simpler re-factor: UX win ... #2

Back-ending the new layout dialogs to native widgets:

- Much smaller(?) set of widgets – a linear change ...

```
include/vcl/weld.hxx
```

Author: Caolán McNamara <caolanm@redhat.com>

Date: Tue Feb 13 17:41:03 2018 +0000

```
native dialog initial basis
```

**More multiple
person years
of the #1
developer +
helpers**

Finished - early 2020 for LibreOffice 6.4

- Now - native gtk3 ... !
- just in time for **gtk4**
 - which broke the threading model we assumed for 20 years

Foundation for JS dialogs ...

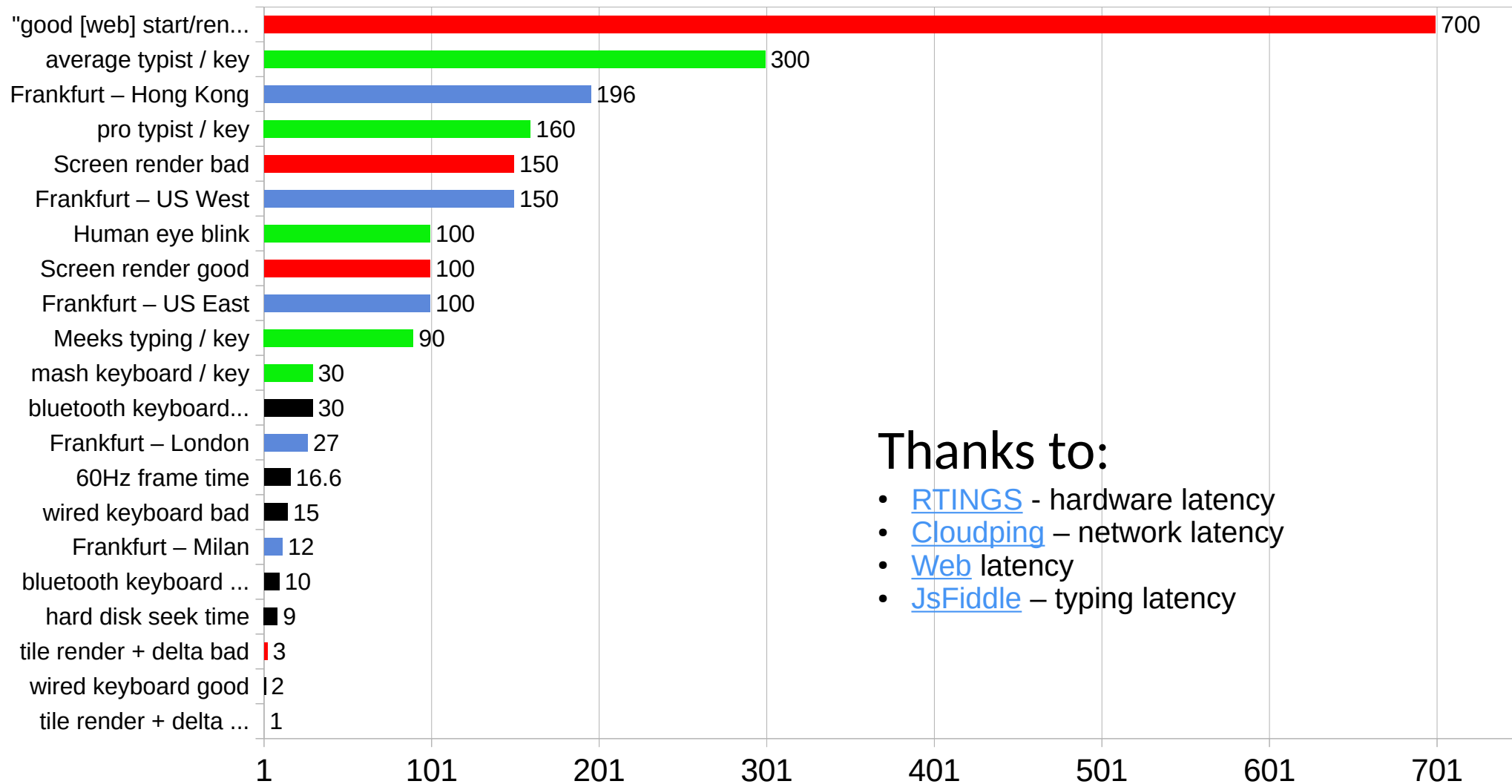


FOSDEM

Two better strands

1. on-line collaboration
2. off-line merging

Sample latencies - Milliseconds - linear plot



Thanks to:

- [RTINGS](#) - hardware latency
- [Cloudping](#) – network latency
- [Web](#) latency
- [JsFiddle](#) – typing latency



FOSDEM

A better approach: a post-hoc diff...

Side-by-side two-up change tracking / versioning / red-lining ...

He heard quiet steps behind him.



That didn't bode well. Who could be following him this late at night and in this deadbeat part of town?



And at this particular moment, just after he pulled off the big time and was making off with the greenbacks.

Was there another crook who'd had the same idea, and was now watching him and waiting for a chance to grab the fruit of his labor?

He heard quiet steps behind him.



That didn't bode well. Who could be following him this late at night and in this deadbeat part of town?



And at this particular moment, just after he pulled off the big time and was making off with the greenbacks.

Was there another crook who'd had the same idea, and was now watching him and waiting for a chance to grab the fruit of his labor?



FOSDEM

New: UI/UX focus

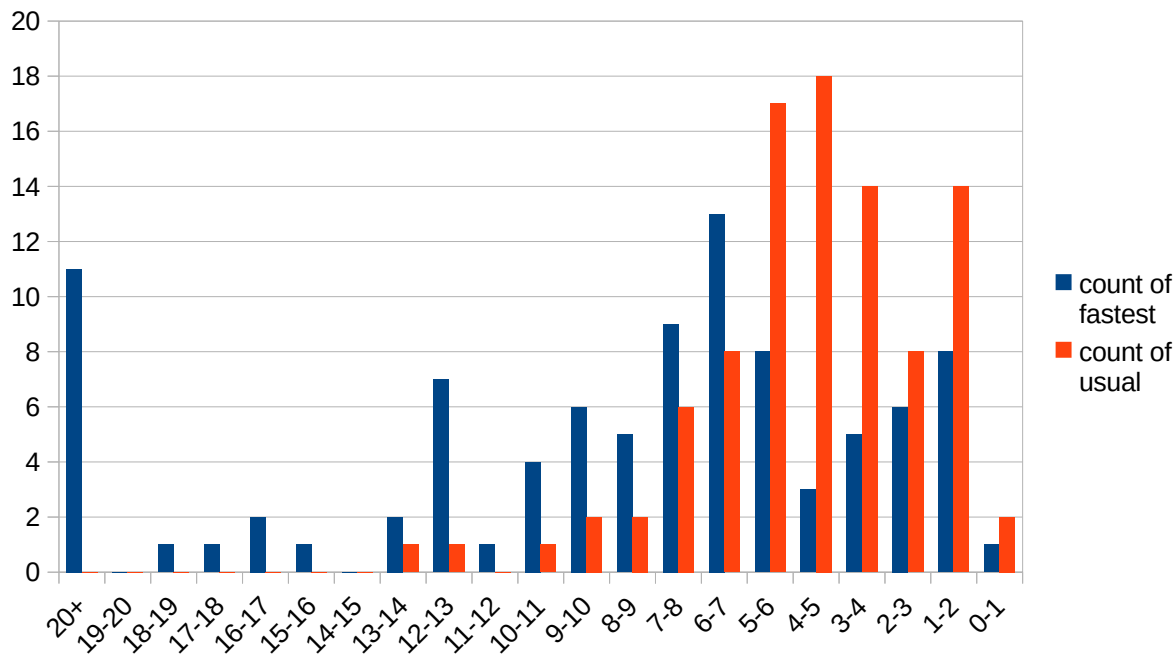
UI logging & charting minus telemetry

Command	Total Commands	Undo count
textInput	62765	85
uno .uno:Paste	1158	54
removetextcontext	10535	38
mouse click	14330	20
mouse buttonup	5110	16
uno .uno:Cut		
dialogevent		
mouse buttondown		
uno .uno:Bold		
uno .uno:Redo		
uno .uno:TableCellBackground		
uno .uno:NumberFormatIncDe		
uno .uno:MoveShapeHandle		
uno .uno:Line		
uno .uno:TransformDialog		
uno .uno>DeleteRows		
uno .uno:DefaultNumbering		
uno .uno:CharBackColor		

Analytics
thanks to:



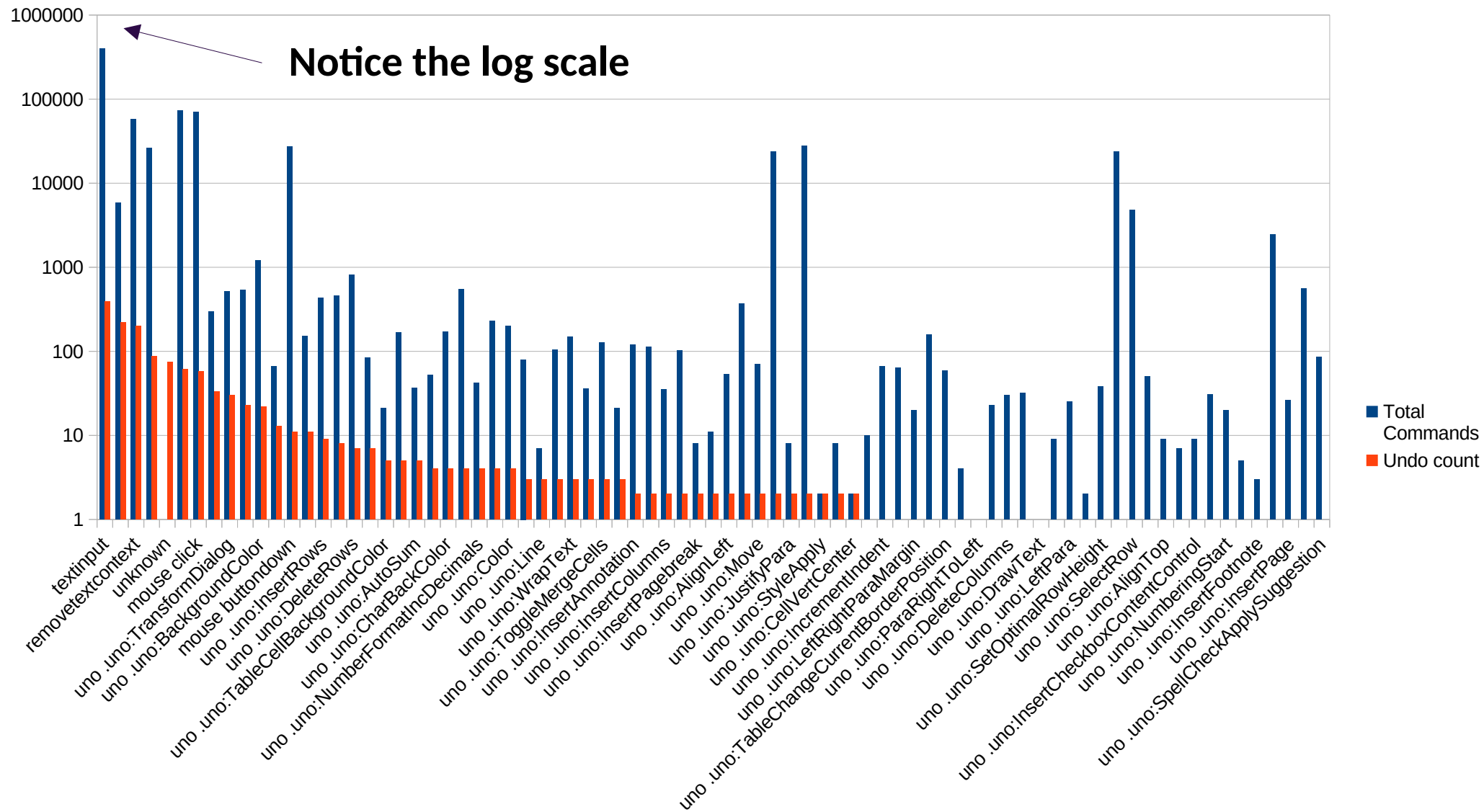
Zentrum
Digitale
Souveränität



Collabora
Online

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1		mouse move	mouse click	textInput	mouse buttondown	mouse buttonup	removeTextContext	dialogEvent	key down	key right	uno .uno:Paste	key up	key left	uno .uno:Copy	uno .uno:SidebarHide	uno .uno:SelectRow	uno .uno:Background	uno .uno:Un	
2	mouse move	0	45174	16452	24085	20171	4225	5011	1149	820	3964	769	564	3441	1337	1089	1057	750	
3	mouse click	56460	0	769	30	938	199	1062	25	16	178	19	15	108	10	9	37	48	
4	textInput	10562	5992	0	3	577	15443	1230	1875	1698	396	790	1174	2	1	1	4	28	
5	mouse buttondown	22540	0	442	2150	1112	123	176	12	15	132	7	3	90	14	16	40	30	
6	mouse buttonup	25578	372	13	0	0	11	52	1	2	1	0	1	5	1	28	0	2	
7	removeTextContext	3248	1683	12586	4	559	0	1275	354	772	40	172	579	6	0	11	2	11	
8	dialogEvent	5609	1170	1330	20	83	239	0	88	32	235	70	25	97	2076	0	0	10	
9	key down	507	313	2783	0	77	524	92	0	520	341	1419	432	174	8	2	1	20	
10	key right	503	308	2073	0	5	366	37	449	0	72	639	1163	43	0	0	0	12	
11	uno .uno:Paste	1803	1939	521	112	219	97	301	378	88	0	164	26	21	0	55	0	33	
12	key up	313	204	1555	1	14	206	14	1817	374	153	0	322	50	1	0	0	20	
13	key left	513	304	825	1	14	152	54	715	1272	62	426	0	6	0	1	0	7	
14	uno .uno:SidebarHide	234	6	1	0	5	0	164	0	0	0	0	0	0	0	0	0	0	
15	uno .uno:Copy	2143	792	5	284	692	1	251	17	18	2	98	28	0	1	64	1	2	
16	uno .uno:SelectRow	1911	4	3	32	17	0	29	2	0	6	1	0	19	0	0	0	4	
17	uno .uno:Background	1134	1	2	3	0	1	1	0	0	0	0	0	0	0	5	0	0	
18	uno .uno:AcceptFocus	551	13	56	3	0	13	188	0	0	52	0	0	162	0	0	0	1	
19	uno .uno:Undo	649	62	78	1	10	54	18	5	3	83	8	3	0	0	4	1	0	
20	key end	43	11	321	0	0	67	3	115	32	0	200	10	1	0	0	0	2	
21	key ctrl-left	20	28	282	0	0	33	1	66	10	10	48	31	0	0	0	0	0	
22	uno .uno:SelectColor	433	8	2	1	46	1	3	0	0	1	0	0	4	0	0	0	2	
23	uno .uno:DefaultBackground	496	1	25	0	0	3	18	4	0	0	5	1	0	0	0	0	0	
24	key home	45	47	129	0	1	20	3	124	3	11	95	11	3	0	0	0	1	
25	uno .uno:Cut	191	63	4	47	74	0	9	0	1	1	5	1	3	0	25	0	3	
26	uno .uno:DeleteRow	142	0	0	23	1	0	0	152	1	0	9	0	0	0	183	0	0	
27	key ctrl-right	13	12	141	0	0	30	0	23	34	1	75	3						
28	uno .uno:Transform	7	11	0	1	450	0	0	0	0	0	0	0						
29	key shift-down	53	23	20	0	2	22	2	81	36	1								
30	uno .uno:ColumnWidth	371	1	2	2	0	1	18	0	1	0								
31	uno .uno:Bold	370	2	0	1	0	0	25	0	0	0								
32	uno .uno:InsertRow	73	0	0	0	0	0	0	1	0	0								

Thanks to:





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Contextual Toolbars

Big popup

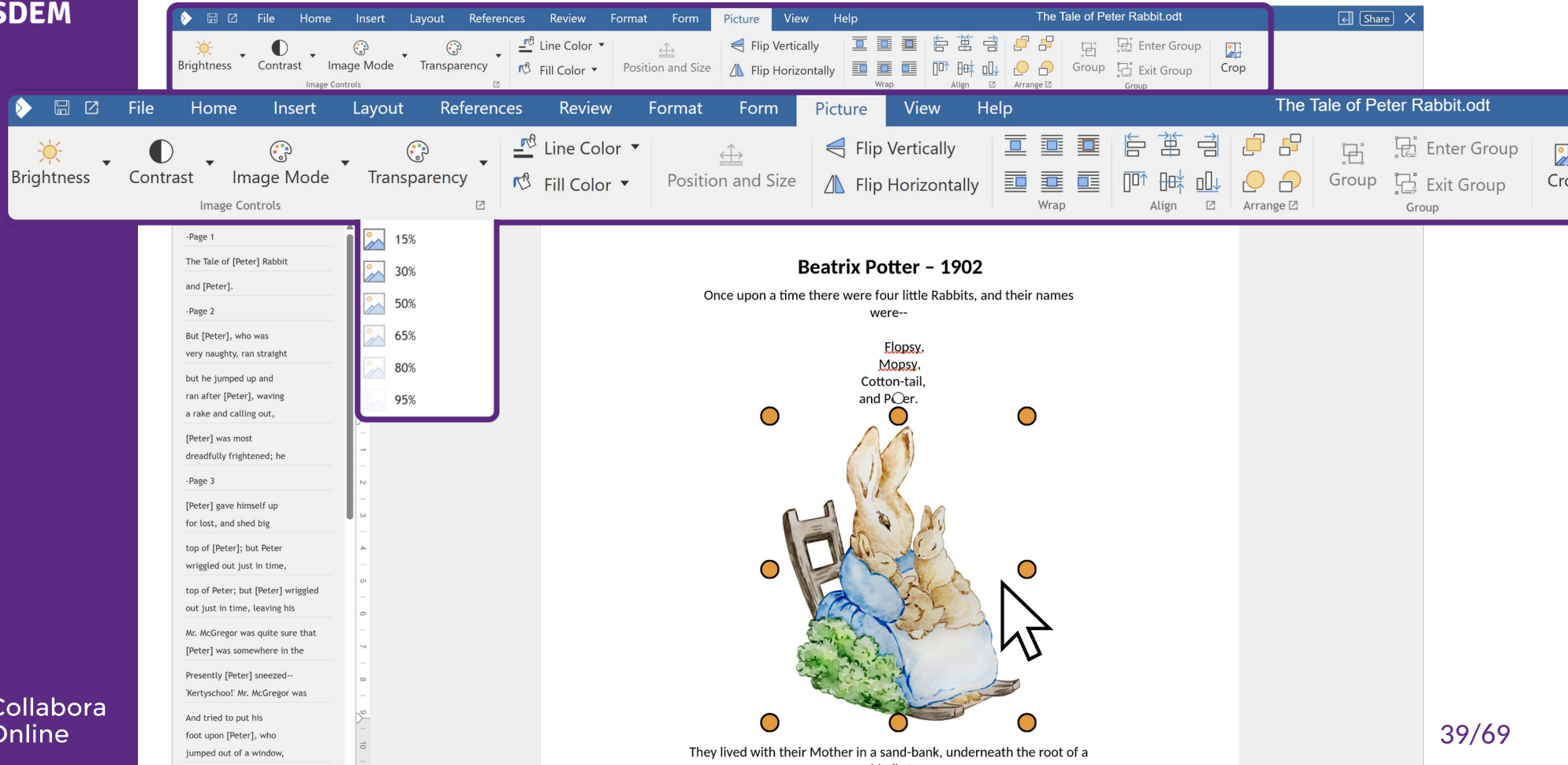
appears right next



font family/**size** colour, and more. No track
pointer, and it fades away when you're done.



On-Click Context Tabs



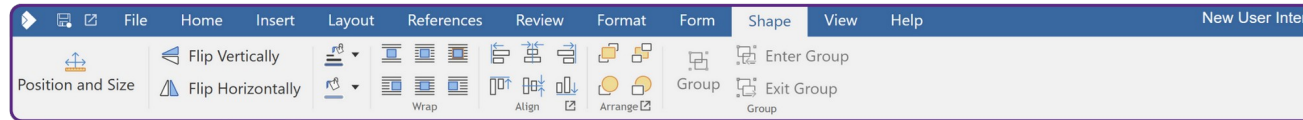
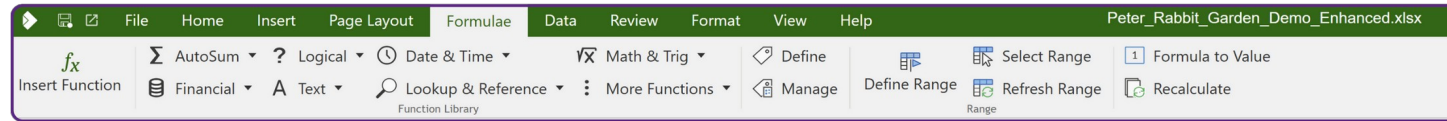
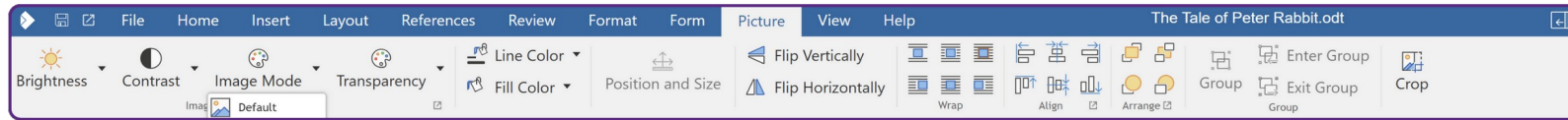
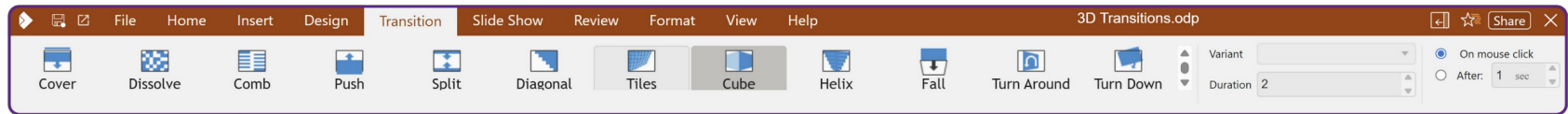
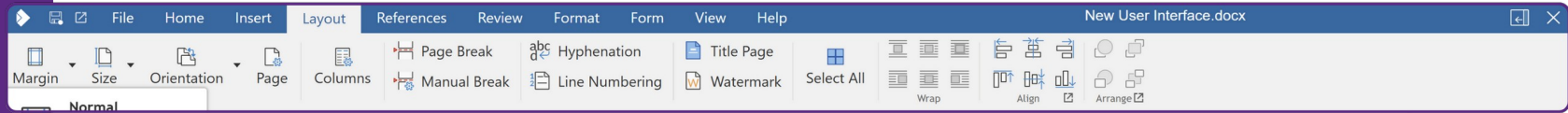


Context Tabs



FOSDEM

Lots of new tabs



Transitions

Layout

Sparklines

Shape

Formulas

Picture

Slide Show

Design



FOSDEM

Context Tabs

The screenshot displays the LibreOffice Impress application interface. The top menu bar includes File, Home, Insert, Design, Transition, Slide Show, Review, Format, Picture, View, and Help. The 'Picture' context menu is open, showing options for Brightness, Contrast, Image Mode, Effects, and Transparency. The 'Image Mode' dropdown is expanded, showing options like Default, Greyscale, Black/White, Watermark, Invert, Sharpen, Remove Noise, Pop Art, and Charcoal Sketch. The slide content shows three image thumbnails labeled 'Default', 'Pop Art', and 'Charcoal'. The 'Default' thumbnail shows a beach scene, 'Pop Art' shows the same scene with a blue and white pattern, and 'Charcoal' shows the scene in a charcoal sketch style. The bottom status bar indicates 'Slide 2 of 8' and 'English (UK)'.



FOSDEM

Intuitive Options

The screenshot displays the Collabora Online interface for editing a presentation. The top menu bar includes File, Home, Insert, Design, Transition, Slide Show, Review, Format, View, and Help. The right side of the menu bar shows the document name 'SCCON COOL Update.odp' and icons for zooming and search.

The left sidebar contains a 'Navigation' panel with 'Slides' and 'Outline' tabs. Below these are thumbnails of various slides, including one titled 'Powerful Tools' and another 'Tab Groupings & Responsive Width'.

The main editing area shows a slide titled 'Carlito' with a 18 pt font size. The 'Format' menu is open, displaying a grid of slide layout templates. A mouse cursor is hovering over the 'Centred Text' template, which is highlighted with a tooltip. The 'Format' menu also includes options for 'New', 'B' (Bold), 'I' (Italic), 'U' (Underline), and 'S' (Strikethrough).

Below the 'Format' menu, there is a 'Picture' menu with options for 'Position and Size', 'Flip Vertically', 'Flip Horizontally', 'Align', 'Arrange', 'Group', 'Enter Group', 'Exit Group', 'Crop', and 'Interaction'. The 'Picture' menu is also open, showing a grid of image formatting options. A mouse cursor is hovering over the 'Invert' option, which is highlighted with a tooltip. Other options visible include 'Greyscale', 'Charcoal', and 'Full Image'.

The bottom of the interface shows the Collabora Online logo and the text 'Collabora Online'.



FOSDEM

Tab Groupings & Responsive Width

The screenshot displays the Collabora Online web application interface. At the top, a menu bar includes options like File, Home, Insert, Layout, References, Review, Format, Form, View, and Help. Below the menu is a ribbon with various tool groups. Four specific tool groups are highlighted with purple boxes: the Clipboard group (containing Paste, Copy, and Paste as Plain Text), the Font group (containing Font face, size, bold, italic, underline, strikethrough, subscript, superscript, text color, and background color), the Paragraph group (containing List, Indent, Decrease Indent, Increase Indent, Bulleted List, Numbered List, Decrease Indent, Increase Indent, Paragraph style, and Paragraph style list), and the Illustrations group (containing Grid, Image, Search, Replace, and Search). The main document area shows the title 'The Tale of Peter Rabbit' in a large, bold font, followed by the author 'Beatrix Potter - 1902'. The text of the story is displayed in a standard font. The status bar at the bottom indicates 'Page 1 of 5', '987 words, 5,568 characters', 'English (UK)', and a zoom level of 170%.

The Tale of Peter Rabbit

Beatrix Potter - 1902

Once upon a time there were four little Rabbits, and their names were--

Flopsy,
Mopsy,
Cotton-tail,
and Peter.

They lived with their Mother in a sand-bank, underneath the root of a very big fir-tree.

'Now my dears,' said old Mrs. Rabbit one morning, 'you may go into the fields or down the lane, but don't go into Mr. McGregor's garden: your Father had an accident there; he was put in a pie by Mrs. McGregor.'



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Search Results in Navigation Bar

The screenshot shows a document editor interface with a search bar at the top. The search bar contains the text "Peter". Below the search bar, the navigation bar displays "Outline" and "Results" tabs, with "Results" selected. It shows "24 results" and a list of search results. The first result is "The Tale of Peter Rabbit" and the second is "and Peter.".

The document content shows the title "Tale of Peter Rabbit" and the author "Beatrix Potter - 1902". The text of the document is as follows:

time there were four little Rabbits, and their names were--

Flopsy,
Mopsy,
Cotton-tail,
and Peter.

their Mother in a sand-bank, underneath the root of a very big fir-tree.

' said old Mrs. Rabbit one morning. 'You may go into



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Latest features

Coming soon ...



FOSDEM

Two-Page View

Beaver Report.docx

Editing | Share

File Home Insert Layout References Review Format Form View Help

Clipboard Paste Font Paragraph

Default Paragraph Body Text Heading 1 Heading 2 Heading 3 Heading 4 Title Subtitle Block Quotation Preformatted Styles

Search Replace

4 Chewing Through Branches: Conflict Resolution

4.1 Parallel Gnaws, Parallel Edits

Two beavers may gnaw the same tree: two users may edit the same document. *Conflictus fit inevitabilis*. Yet with structured negotiation — whether by tail slap or document repair dialogue — both nature and software find harmony.

4.2 Merge Conflicts in the Wild

In the forest, the tree will fall to one side. In a document, the text must also resolve to one final branch. Collabora Online ensures that edits are *synchronized* in real-time, reducing friction and smoothing the current. *Nulla stagnatio, nulla chaos*.

4.3 Consensus by Water Flow

Ultimately, the river decides. Likewise, in online editing, the flow of collaboration brings consensus. UI/UX improvements — contextual toolbars, responsive layouts, adaptive design — ensure that resolution feels natural, like water finding its way downhill.

5 Waterproof Collaboration: Multi-Tenant Lodges

5.1 Shared Spaces, Separate Rooms

Within one lodge, several families may co-exist. Within one Collabora Online deployment, multiple *organizations* cohabit the same *containerized* infrastructure. Each has its room, yet all benefit from shared stability. Multi-tenant *ipsum, semper integratum*.

5.2 Stateless Streams

Beaver dams store water, but not memory; the current always moves. In *containerized* editing, state is distributed and recoverable, not tied to a single machine. This allows scalability: lodges can grow, clusters can expand, rivers can widen without losing flow.

5.3 Always Online, Always Afloat

A good lodge resists floods; a good platform resists downtime. Collabora Online is designed for high availability: documents remain accessible, edits propagate instantly, users float together even across turbulent waters.

6 Beaver vs Document Editor Chart

Category	Beavers	Collabora Online	Competitors
Scalability	High	Medium	Low
Collaboration	Medium	High	Low
Security	Medium	High	Low
Interoperability	Low	High	Medium

7 Security by Nature: Teeth, Trees, and TLS

7.1 Incisors as Intrusion Detection

Beaver incisors grow continuously, sharpened to defend against threats. In digital collaboration, TLS encryption and container isolation function the same way: ever-ready, ever-strong, guarding the lodge from intrusion.

7.2 Mud Walls and Firewalls

Beavers reinforce lodges with mud, sealing cracks and gaps. In technology, firewalls and layered access controls protect against breaches. *Ubi cauda iunditur, ibi securitas servatur*.

5 / 7 6 / 7

Page 5 of 7 | 1,170 words, 7,953 characters | English (UK)

Collabora Online

47/69



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New Table Design Toolbar

The screenshot shows the 'Table Design' ribbon in Microsoft Excel. The 'Table Style Options' group contains the following options:

- ☒ Header Row
- ☐ Total Row
- ☒ Banded Rows
- ☐ Banded Columns
- ☐ First Column
- ☐ Last Column
- ☒ Filter Buttons

The 'Table Style' dropdown is set to 'Table Style Medium 2'. Below the ribbon, the formula bar shows 'B3' and the formula '= 1'. The table below has three columns: 'First Column', 'Second Column', and 'Third Column'. The data is as follows:

	First Column	Second Column	Third Column
1	1	2	3
2	2	4	6
3	3	6	9
4	4	8	12
5	5	10	15
6	6	12	18
7	7	14	21
8	8	16	24
9	9	18	27
10	10	20	30

Thanks to Markus
Mohrhard and
Balazs Varga



FOSDEM

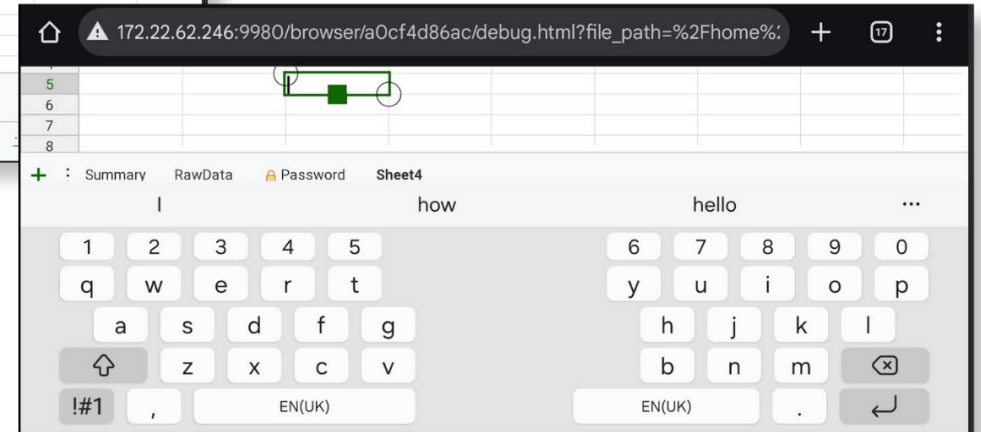
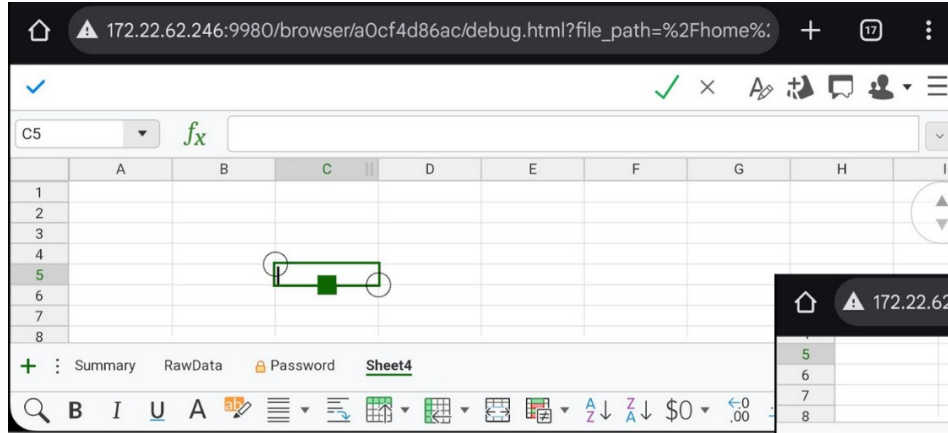
Sheet View

The screenshot shows the Collabora Online interface with two overlapping spreadsheet windows. The top window, titled 'Filtering.ods', is in 'Sheet View' and displays a table with columns: Date, Region, Rep, Item, Units, Unit Cost, and Total. The bottom window, titled 'Filtering.xlsx', is also in 'Sheet View' and displays a similar table. The interface includes a top menu bar with options like File, Home, Insert, Page Layout, Formulas, Data, Review, Format, View, and Help. A toolbar below the menu bar contains icons for various functions like Freeze, Focus Cell, Zoom, Compact view, Collapse Tabs, Status Bar, Dark Mode, Sidebar, and Navigator. The status bar at the bottom shows 'Sheet 1 of 2' and 'Select'.

Date	Region	Rep	Item	Units	Unit Cost	Total
10/10/23	Cambridge	Smith	Accessories	50	£19.99	£999.50
10/11/23	Cambridge	Jardine	Guitar	25	£499.99	£12,499.75
10/12/23	Cambridge	Gill	Accessories	50	£25.00	£1,250.00
10/12/23	Cambridge	Gill	Accessories	50	£25.00	£1,250.00
10/15/23	Cambridge	Andrews	Guitar	7	£399.99	£2,799.93

Date	Region	Rep	Item	Units	Unit Cost	Total
10/14/23	London	Jones	Accessories	80	£4.99	£399.20
10/18/23	London	Jones	Accessories	60	£8.99	£539.40
10/20/23	London	Howard	Accessories	29	£1.99	£57.71

Intelligent Toolbars on Mobile



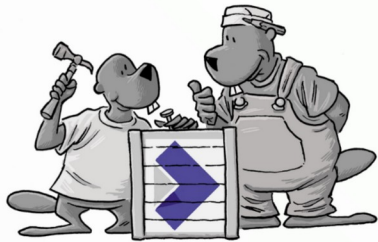
Top and bottom toolbars
auto-hide when keyboard
opens



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Follow-me Presentation

Beavers: Nature's Engineers

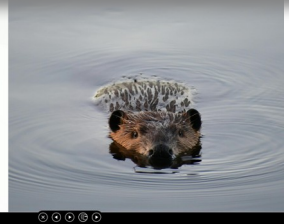


Thanks to:

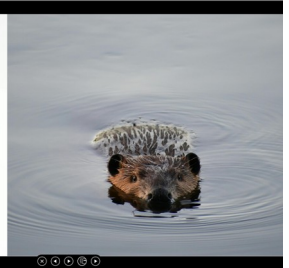


New “Present to All”
option in UI will
automatically start
presentation for all

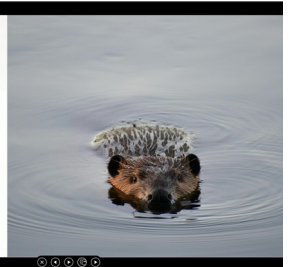
Beavers:
Nature's
Engineers



Beavers:
Nature's
Engineers



Beavers:
Nature's
Engineers



Online



FOSDEM

Follow-me Presentation

Beaver Basics

Semi-aquatic rodents:
two species

Second largest rodent in
the world (after the
Capybara)

Adults typically weigh
40-70 pounds
(18-32 kg)
and can measure
3-4 feet
(0.9-1.2 m) long
(including the tail)



Other users follow, but
can go backwards, with
local WebGL transitions ...

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FOSDEM

Access Settings from Documents

1 Introduction: Why Beavers and Editors?

1.1 Share the Experience

Beavers live communally. Likewise, Collabora Online offers a collaborative window — to collaborate like concentric waves.

1.2 Local Experience

A beaver lodge has a visible, some hidden editors mirror this offering entry only. Ubi sign-in est, i UI/UX design, the entrance is not only safe, but also welcoming: users glide in, just as beavers dive beneath the surface.

Options

Interface Settings

Set default interface preferences.

Notebookbar view Compact view

☐ Dark Mode

Calc Writer Impress Draw

☐ Show status bar ☐ Accessibility Checker ☐ Navigator

☒ Show

Cancel Save



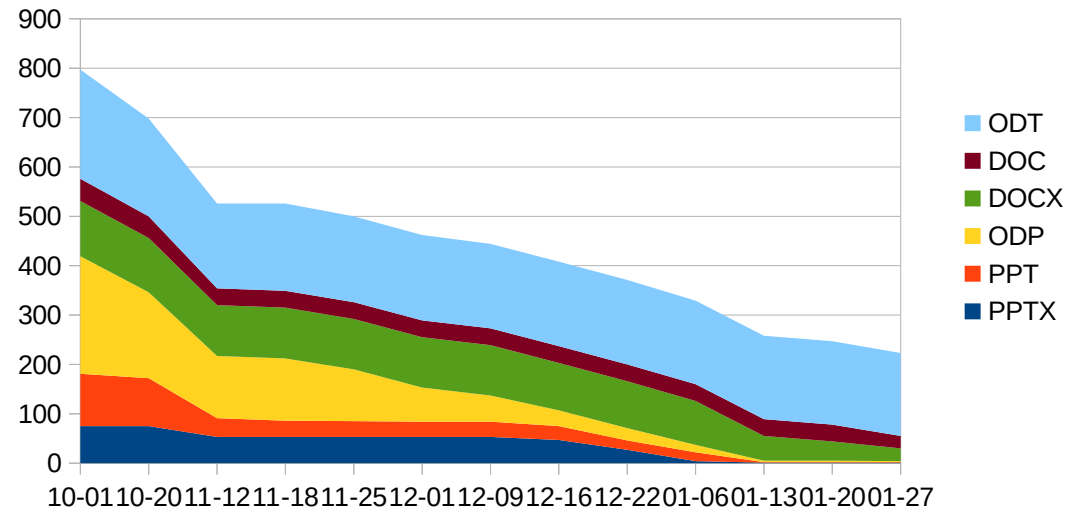
FOSDEM

Systematic Interoperability wins

Interop. commits in Collabora Online 25.04:

- Last four months: ~200 targetted interop fixes
- bug fixes & OOXML conformance wins from ~250k worst-docs ever.
 - Writing better Microsoft XML
 - Systematic metric chasing
 - Automated testing and bisection

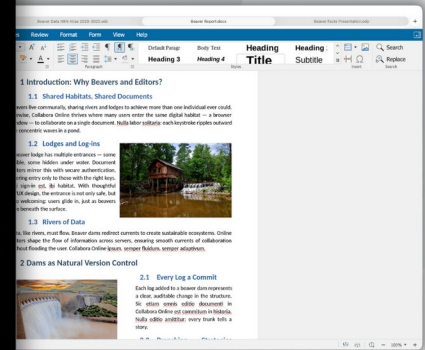
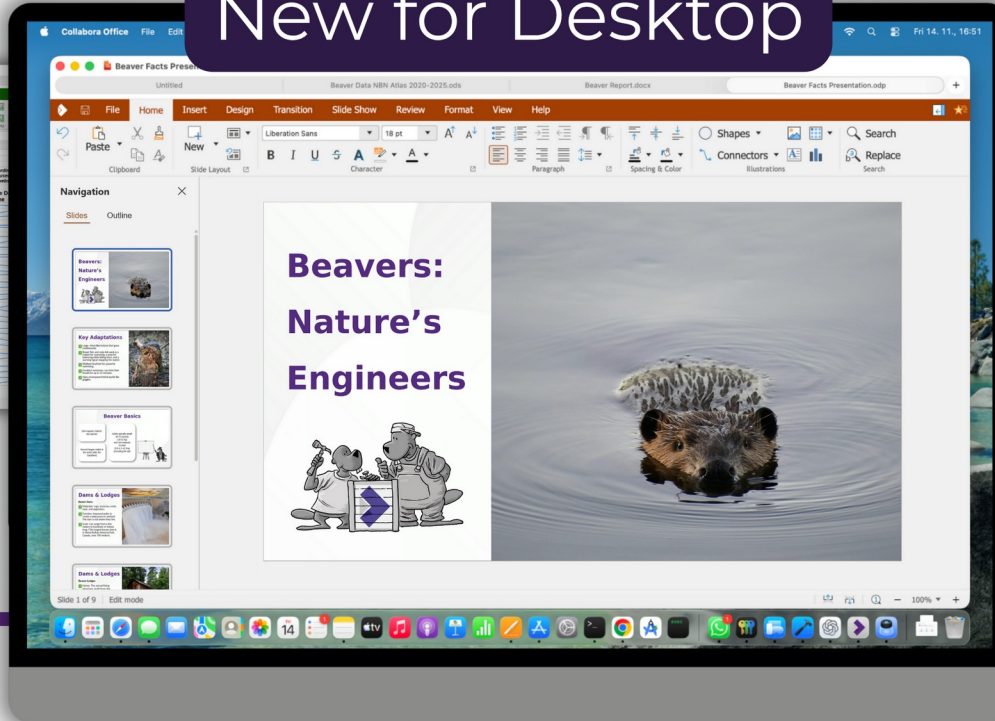
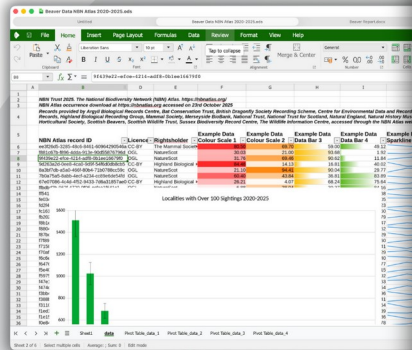
Toxic bug document export to OOXML issues



Collabora
Online

OFFICE

New for Desktop



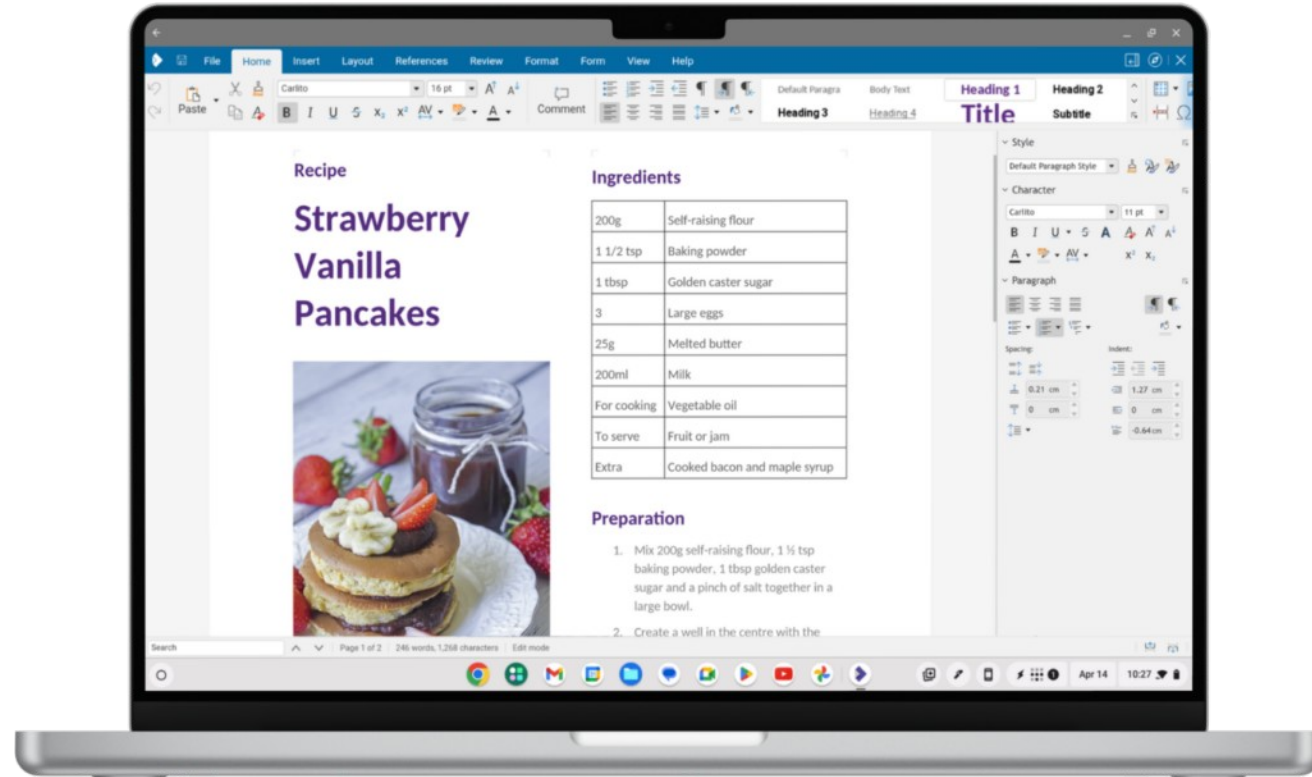
25.04



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Done this for years: eg. chromeOS

If you compiled our iPhone version right → could also run on Mac ...





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Native code advantages:

Off-line support

- as with native Phone / Mobile apps
- lower latency / higher performance for editing

Access to platform APIs

- Real rich format clipboard APIs
- Multi-Screen and projector detection management APIs
- Proper printing APIs: “what printers, what paper sizes” ...
- Image formats: HIEC eg. etc. ...

Memory sharing → cf. WASM disappointment ([chrome](#) & [firefox](#))

- SharedWorker does not provide Worker nor SharedArrayBuffer



FOSDEM

Bringing Collabora Online to desktop

The screenshot displays the Collabora Online desktop application interface. The main window shows a spreadsheet titled "Beaver Data NBN Atlas 2020-2025.ods". The spreadsheet contains data from the NBN Atlas, including columns for "NBN Atlas record ID", "License", "Rightsholder", "Example Data", "Scientific name", "Taxon author", "Common name", "Species ID", "Taxon Rank", "Occurrence", and "Start date". The data is organized into several tables, with "Example Data" tables providing detailed information for specific records. The spreadsheet also includes several charts: a bar chart titled "Localities with Over 100 Sightings 2020-2025", a line chart titled "Beaver Sightings By Latitude 2020-2025", and another line chart titled "Beaver Sightings By Latitude 2020-2025 (Latitude 55.8 - 56.8 Expanded)". The application interface includes a menu bar (File, Home, Insert, Page Layout, Formulas, Data, Review, Format, View, Help) and a toolbar with various editing and formatting tools. The status bar at the bottom shows "Sheet 2 of 6", "Average: Sum 0", and "Edit mode".



Sailing Yacht.odt - Collabora Office

Collabora Office



Home

New

Open

Info

Save

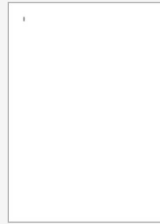
Print

Export

About

Home

Start a new document from one of the following templates.



Blank Document



CV



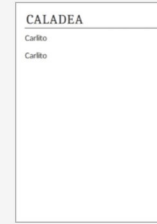
Default Style



Modern Business
Letter Sans Serif



Modern Business
Letter Serif



Modern Style

[More Templates](#)

Recent

Name

Modified Date



u1.ods

C:\Users\tml\CODA Sample Documents\

2026/01/19 at 15:45:05



Beaver Report.docx

C:\Users\tml\CODA Sample Documents\

2026/01/19 at 15:44:43



Search



15:45
2026-01-19



Sailing Yacht.docx - Collabora Office

FileHomeInsertLayoutReferencesReviewFormatFormViewHelp

Clipboard

Font

Paragraph

Default Paragraph

Body Text

Heading 3

Heading 4

Insert

Search

One / Three

Sailing yacht

A sailing yacht is a vessel that uses sails as its primary means of propulsion, or power vessel. There is no standard definition so the term applies here to sailing vessels that have a cabin with amenities that accommodate overnight use. To be termed a "yacht", as opposed to a "boat", such a vessel is likely to be at least 33 feet (10 m) in length and have been judged to have good aesthetic qualities.[4] Sailboats that do not accommodate overnight use or are smaller than 30 feet (9.1 m) are not universally called yachts. Sailing yachts in excess of 130 feet (40 m) are generally considered to be [superyachts](#). [5]

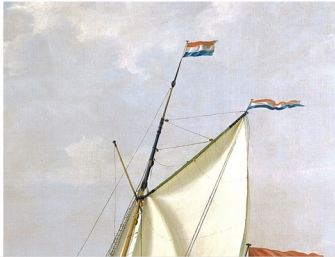
Sailing yachts are actively used in sport and are among categories recognized by the governing body of sailing sports, [World Sailing](#). [6]

Etymology

The term, yacht, originates from the [Dutch](#) word *jacht* (pl. *jachten*, which means "hunt"), and originally referred to light, fast sailing vessels that the [Dutch Republic](#) navy used to pursue [pirates](#) and other aggressors around and into the shallow waters of the [Low Countries](#). [7]

History

The history of pleasure boats begins with rowed craft in Pharaonic Egyptian times. The history of sailing yachts begins in Europe in the beginning of the 1600s with the building of a pleasure vessel for the son of [King James I of England](#). Pleasure vessels acquired



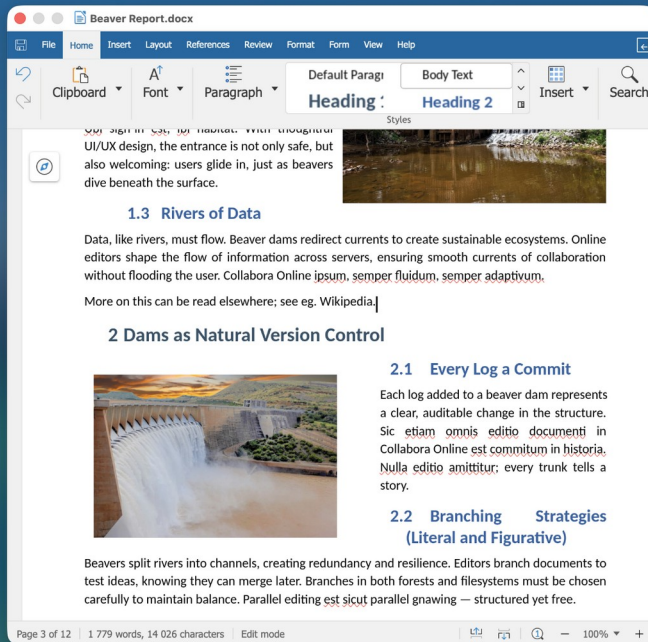
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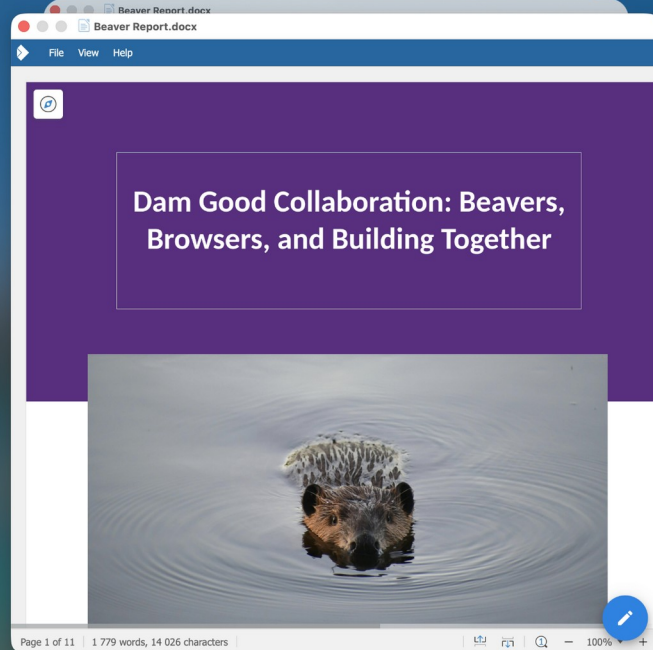


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Current Document

Done



Restore

Today at 17:48



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Complementary to Classic

Collabora Office Classic

- Ongoing support, huge code-base / tech overlap
- Community backing the code-base

New Collabora Office – complementary to Classic

- No Java, No Database, No mail-merge
- No master-documents
- No OLE embedding, DDE ...
- No Macro authoring, debugging,
- No solvers, mail-merge
- etc. etc. etc. !

Next: Collaboration integration

Desktop Collabora Office

- collab/ end-point added to Collabora Online
- New protocol to negotiate collaboration
 - Proxy storage access & locking via WOPI
 - *“Tony wants to collaborate on-line with you” ... accept/reject*

Same familiar user experience

- Seamless embedding on-line & **off-line**

Far better platform integration – avoiding the browser ...

- Copy/Paste, Printing etc.

Hackfest

2 & 3 February 2026
Brussels

SIGN UP TODAY



Collabora
Office



Bedford
Hotel



28th & 29th April 2026

Hamburg, Germany

col.la/cooldays





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Comfort for computer-widow(ers)

Mascot:

- Emphasis on hard work & contribution:

The Open Road to Freedom – a comic ...

<https://www.collaboraonline.com/torf>





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Conclusions & Questions

Office is harder than you think

- The browser gets you part-way
- Join us building upwards,
not duplicative re-building

Thank you to all who contribute

- Volunteers, staff, partners &
customers – you rock !

Get involved: We Are Hiring !

- <https://collaboraonline.github.io/>
- <https://www.libreoffice.org/community/get-involved/>

Oh, that my words were recorded, that they were written on a scroll, that they were inscribed with an iron tool on lead, or engraved in rock for ever! I know that my Redeemer lives, and that in the end he will stand upon the earth. And though this body has been destroyed yet in my flesh I will see God, I myself will see him, with my own eyes - I and not another. How my heart yearns within me. - Job 19: 23-27

