



LibreOffice
The Document Foundation



Interoperable Office Collaboration

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TIRANA | 12 Sept. 2019

What is Collaboration?

Collaborative real-time editor (2 modes)

In the end all “copies” are the same!

1) Real-Time Mode

Good for working with a group of trusted members.

2) Non-Real-Time Mode

**Users like to be in control of all changes.
Legal departments of two companies collaborating.**

What is Collaboration?

Collaborative real-time editor (2 modes)

1) **Real-Time Mode**

(e.g. Etherpad, Google Docs, etc.)

Users can edit the same document simultaneously.

2) **Non-Real-Time Mode**

(similar revision control systems)

Users edit a copy of document and merge later.

What is Collaboration?

Collaborative real-time editor (2 modes)

In the end all “copies” are the same!

1)

**Automatic fix of merge conflicts!
(for convenience).**

2)

**Merge conflicts have to be resolved by the
user!**

How do real-time editors work?

- **No documents are dispatched!**

As stupid as developers sending software repos!

- **Sending changes/operations/differences/DIFFs!**

Best not text/syntax based, but higher abstraction level:

semantic changes!

Requirements to implement Collaboration in LibreOffice?

„Some time-machine would be
appropriate..“

Why is Collaboration a Problem?

“Collaboration” in the 80ths!

Design based on former Requirements

- In the 80ths: **One person on single machine**
- Exchanging document by **floppy disc** or **modem**

Document Collaboration Today

New Requirements

- With Smartphones **everyone** has **multiple machines**
(Smartphone & PC/Laptop)
- **Exchanging documents** faster via Internet, Mail, Dropbox, etc. will not solve the **merge problem!**
- **Key Collaboration Question:**
What have you changed?

Document Collaboration Idea

New Change Design

- Allow **collaboration functionality** similar as software developers have with repositories
- **Exchanging changes (commits) instead of documents (repositories)** via Internet, Mail, Dropbox, etc.
- **Solving Key Question:**
What have you changed?

Interoperable Collaboration

Exchanging ODF Changes



ODF Application

 ODF™ 2nd paragraph new



ODF Application

 ODF™ 2nd paragraph new



Google Docs

ODF Application

Interoperable Collaboration

Exchanging ODF Changes



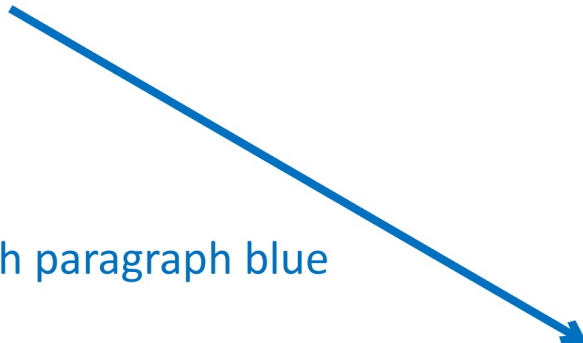
ODF Application



 ODF™ 4th paragraph blue



ODF Application



 ODF™ 4th paragraph blue

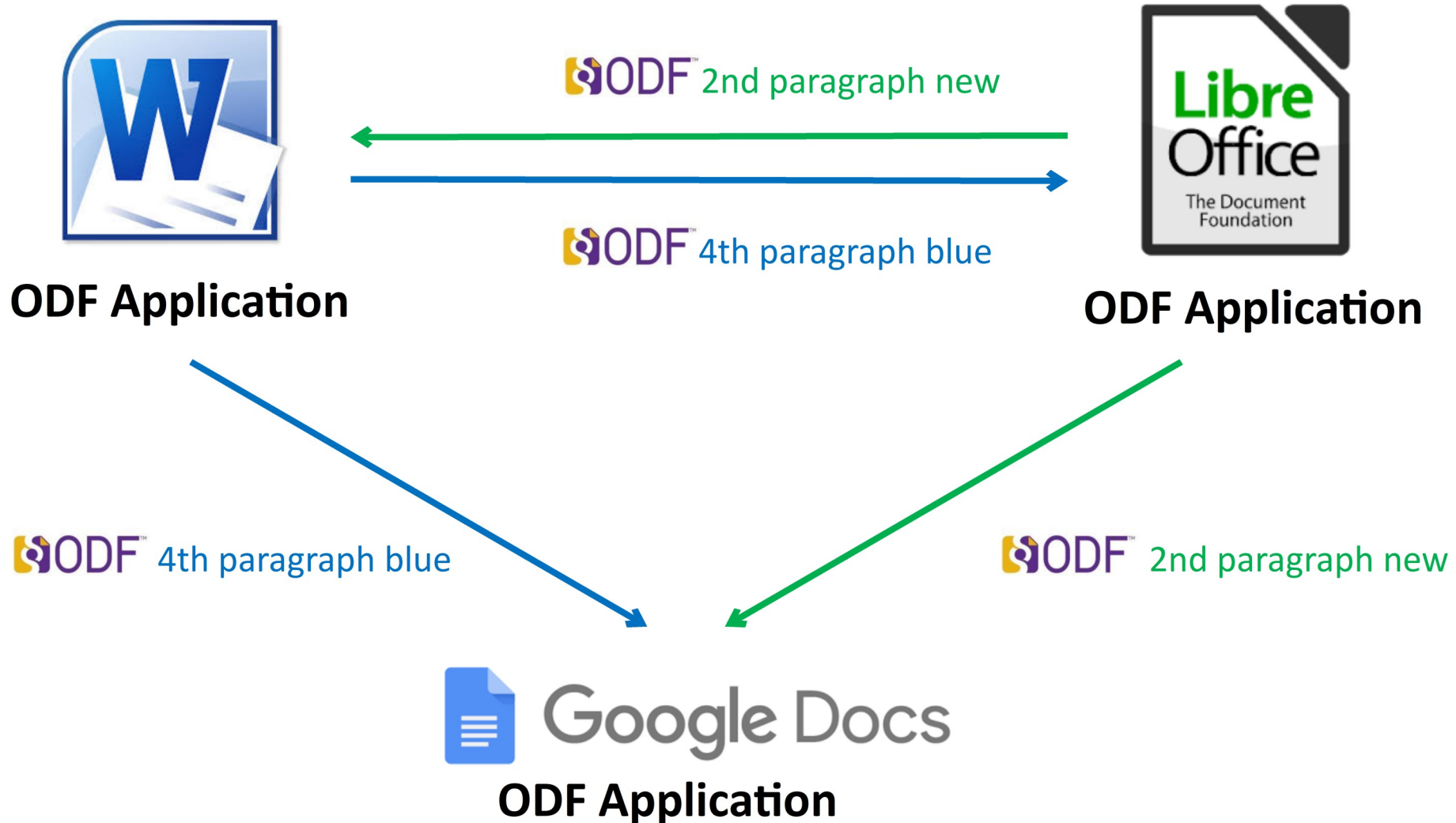


Google Docs

ODF Application

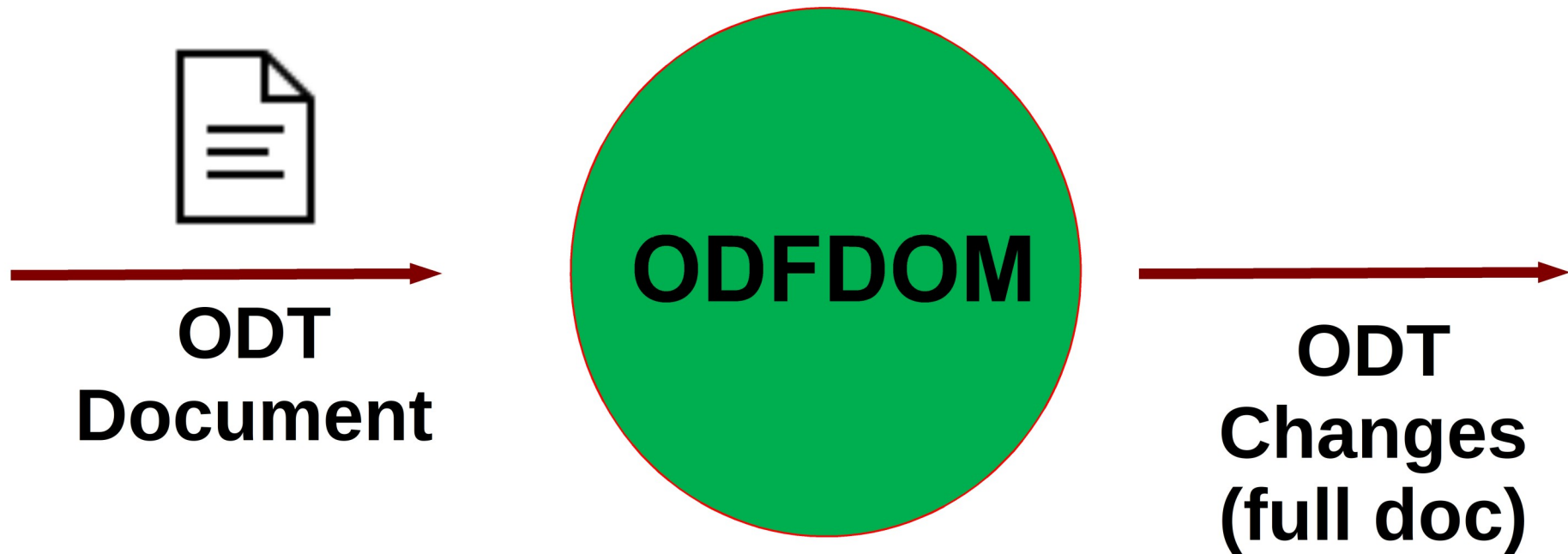
Interoperable Collaboration

Exchanging ODF Changes



ODT ⇔ Changes

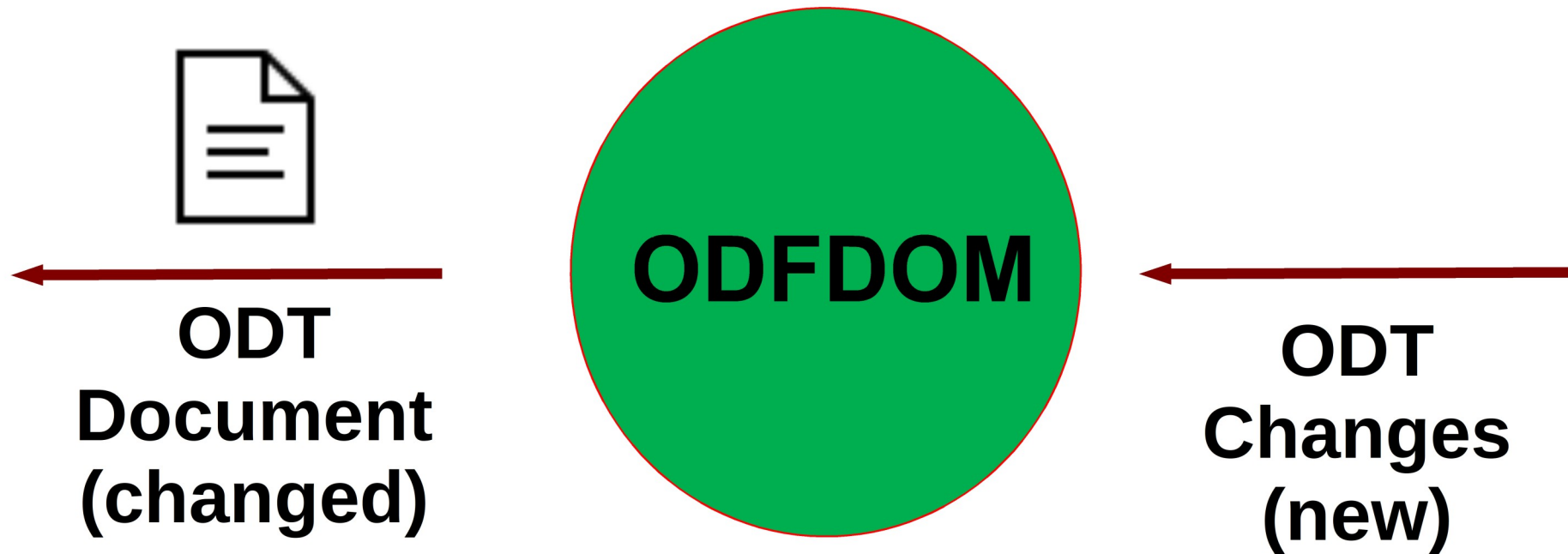
sponsored by PrototypeFund



See <https://github.com/svanteschubert/odftoolkit/tree/odf-changes/>
Soon <https://github.com/tdf/odftoolkit> (1.0.0-beta)

ODT ⇔ Changes

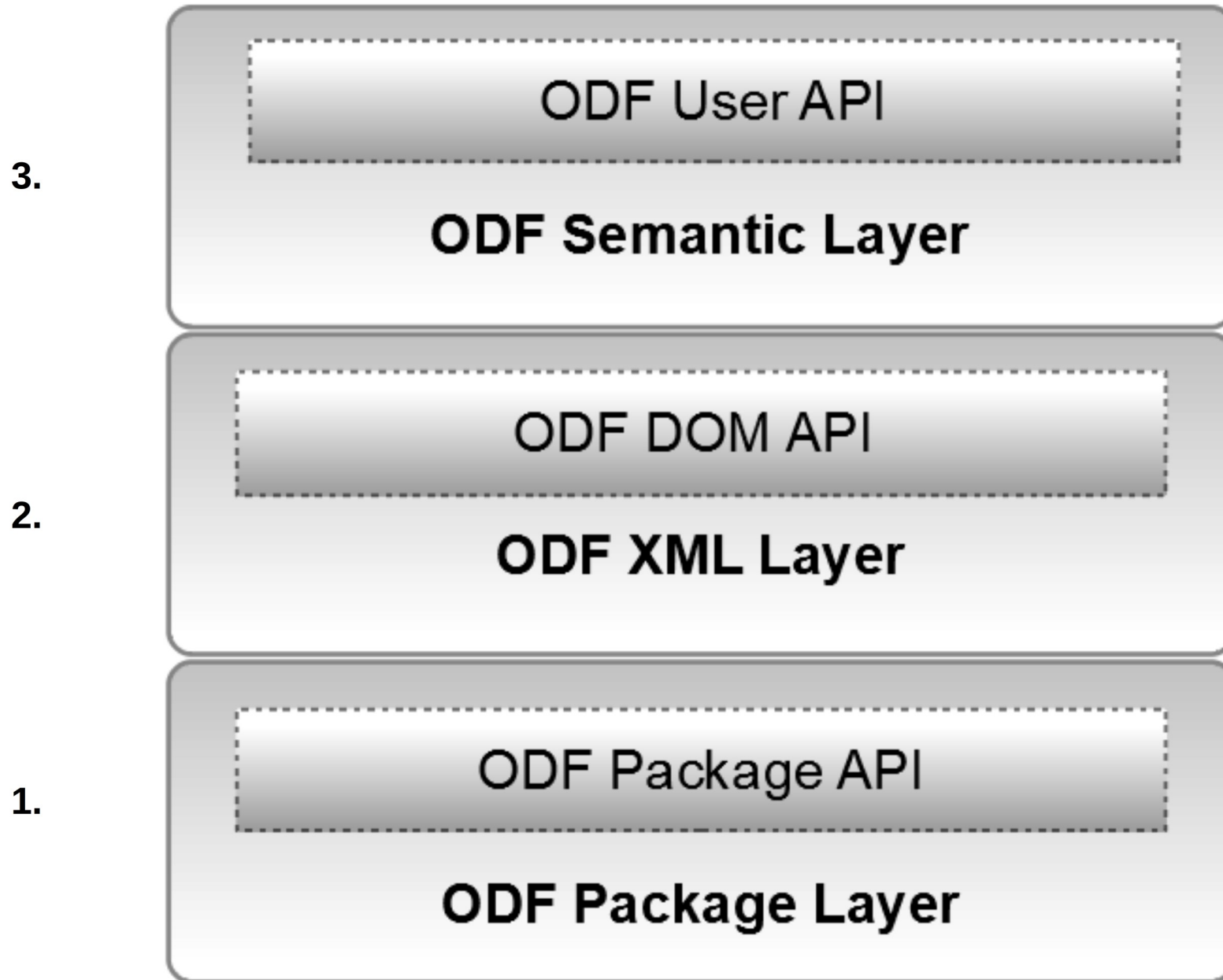
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See <https://github.com/svanteschubert/odftoolkit/tree/odf-changes/>
Soon <https://github.com/tdf/odftoolkit> (1.0.0-beta)

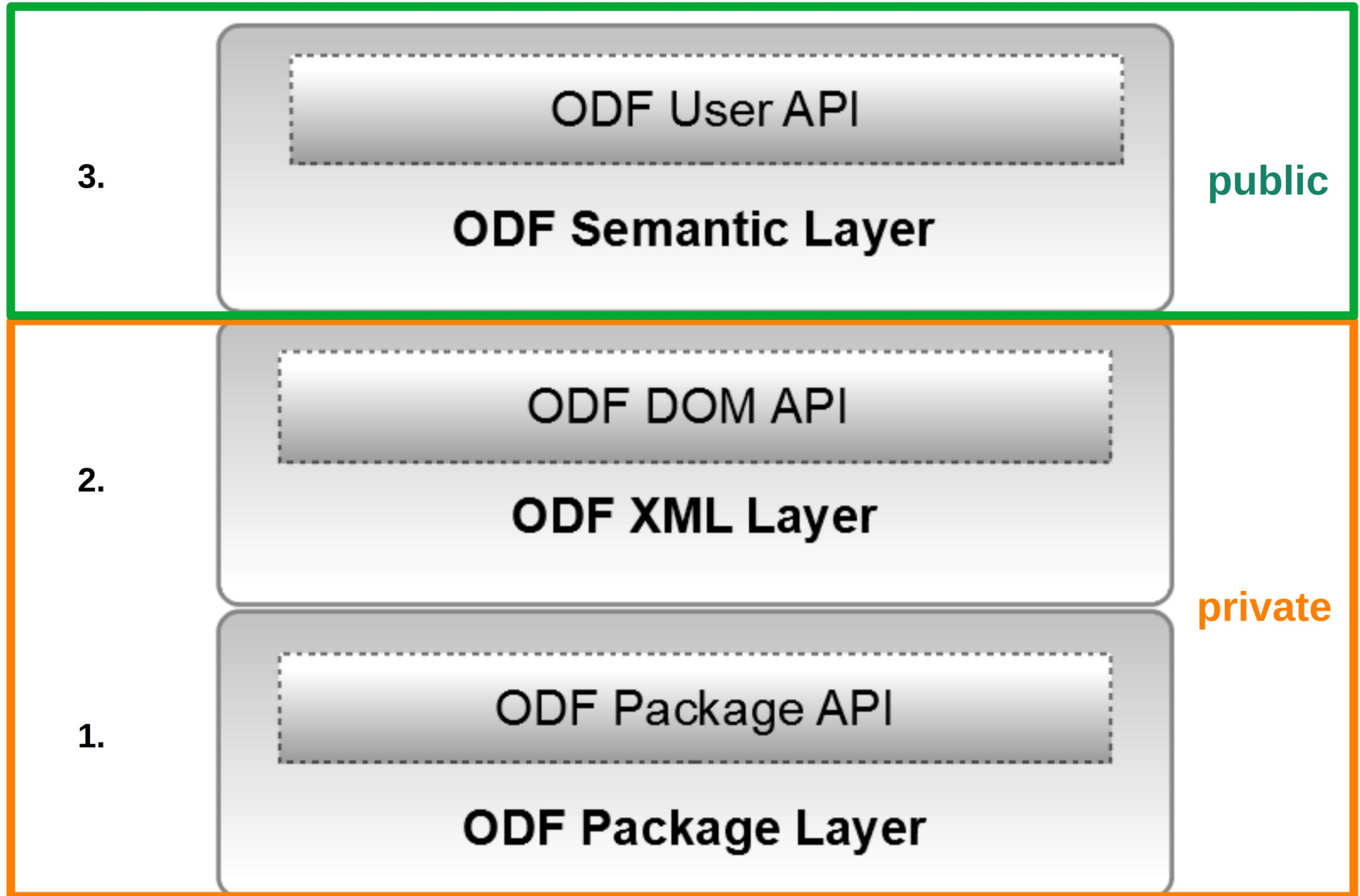
ODFDOM

Architecture / Local API



ODFDOM

Architecture / Local API (in spe)



ODF Collaboration Prototype

Upcoming Goals

- **Prototype of Collaboration of Editors**
based on ODF Changes (ODFDOM)
- **WYSIWYG Editors with different feature set editing same ODT Document:**
 - LibreOffice (ODT)
 - Emacs (Text)
 - **CKEditor 5 (HTML 5)**

ODF Toolkit – CKEditor5

Proof of Concept

- Build your CKEditor5 example:

```
git clone -b stable https://github.com/ckeditor/ckeditor5-build-classic.git  
npm install  
npm run build
```

- Open local editor in browser (& add eventlistener from notes)

```
./sample/index.html
```

ODF Toolkit – CKEditor5

Demo results in Chrome console

- `eventinfo[object Object] args[{"baseVersion":12,"position":{"root":"main","path":[0,6],"stickiness":"toNone"},"nodes":[{"data":"X"}],"shouldReceiveAttributes":true,"__className":"InsertOperation"}]`
- `index.html:48 eventinfo[object Object] args[{"baseVersion":13,"range":{"start":{"root":"main","path":[0,3],"stickiness":"toNext"},"end":{"root":"main","path":[0,7],"stickiness":"toPrevious"}},"key":"italic","oldValue":null,"newValue":true,"__className":"AttributeOperation"}]`

Bringing ODF Changes to ODF Specification

- ODF XML base of interoperability
- Define „User Semantic Entities“ (e.g. table, image) from ODF XML
- Define how „User Semantic Entities“ are changed via parameters of API

ODF GRAMMAR - TEXT

HARD TO READ! WE NEED TOOLS!



```
<define name="table-table">
  <element name="table:table">
    <ref name="table-table-attlist"/>
    <optional>
      <ref name="table-title"/>
    </optional>
    <optional>
      <ref name="table-desc"/>
    </optional>
    <optional>
      <ref name="table-table-source"/>
    </optional>
    <optional>
      <ref name="office-dde-source"/>
    </optional>
    <optional>
      <ref name="table-scenario"/>
    </optional>
    <optional>
      <ref name="office-forms"/>
    </optional>
    <optional>
      <ref name="table-shapes"/>
    </optional>
    <ref name="table-columns-and-groups"/>
    <ref name="table-rows-and-groups"/>
    <optional>
      <ref name="table-named-expressions"/>
    </optional>
  </element>
</define>
<define name="table-columns-and-groups">
  <oneOrMore>
```

ODF 1.2 XML:

- 598 XML Elements
 - 1300 XML Attributes
- > 18k lines

ODF GRAMMAR - TEXT

HARD TO READ! WE NEED TOOLS!



```
<define name="table-table">
  <element name="table:table">
    <ref name="table-table-attlist"/>
    ...

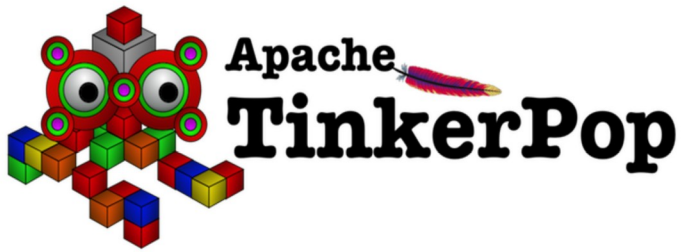
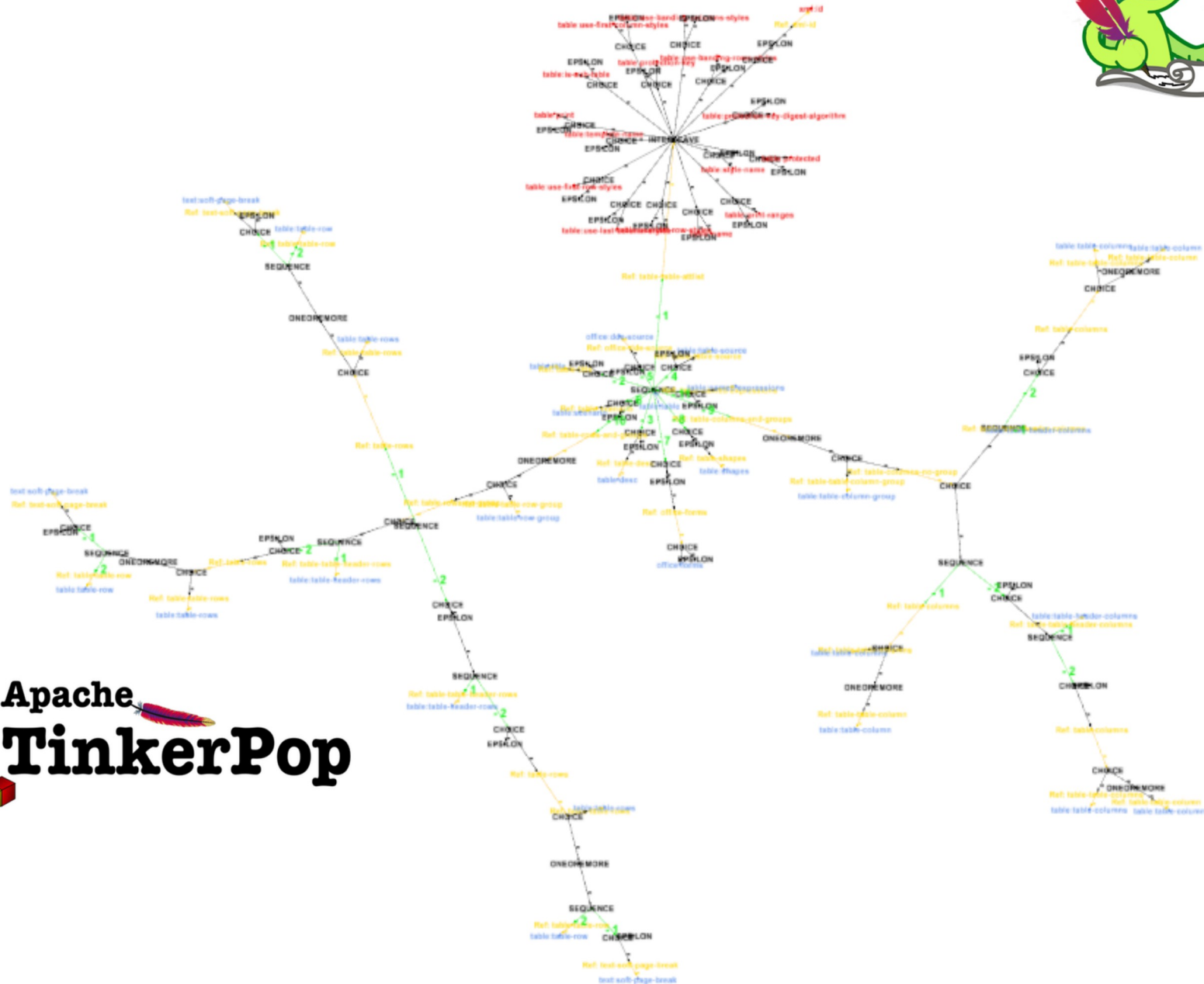
  <optional>
    <ref name="text-soft-page-break"/>
  </optional>
  <ref name="table-table-row"/>
```

ODF 1.2 XML:

- 598 XML Elements
 - 1300 XML Attributes
- > 18k lines

ODF GRAMMAR - GRAPH

TABEL ELEMENT WITH CHILDREN



ODF GRAMMAR - GRAPH

HARD TO READ! WE NEED REFACTORIZING!



text:soft-page-break

Ref: text:soft-page-break

EPSILON

CHOICE

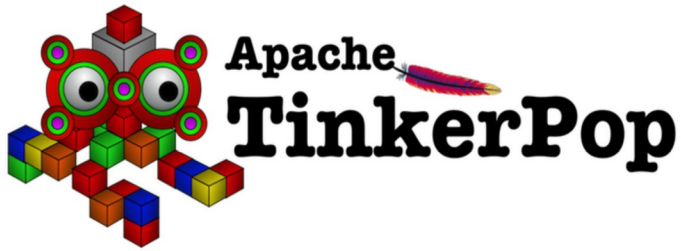
table:table-row

Ref: table:table-row

1

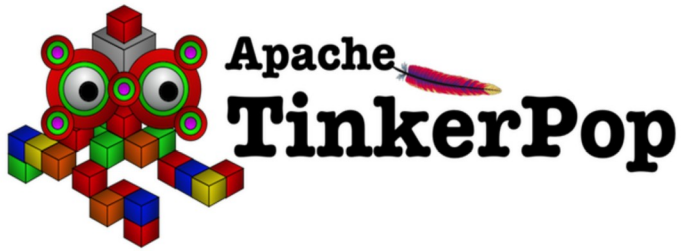
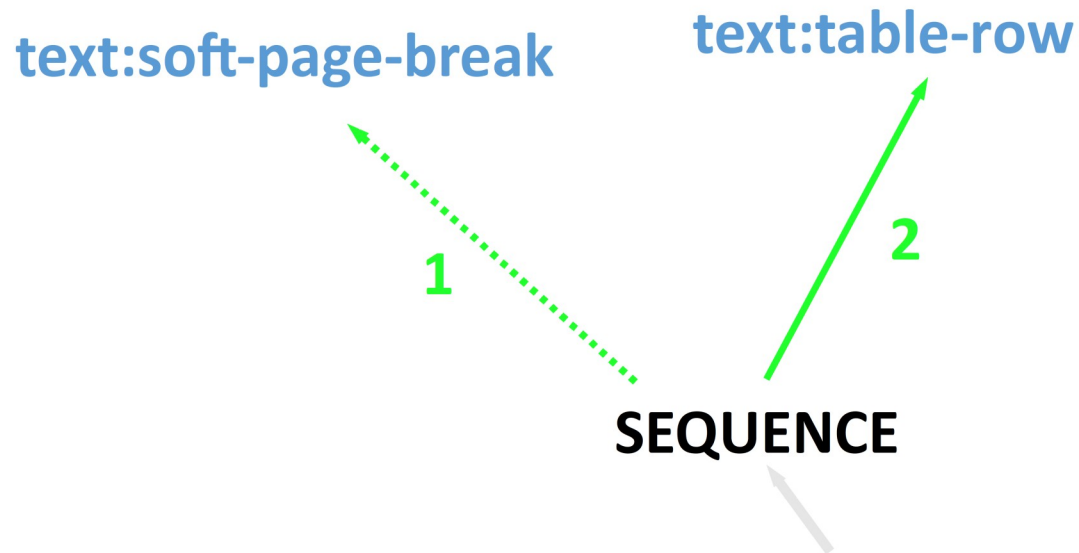
2

SEQUENCE



ODF GRAMMAR - GRAPH

SIMPLIFIED FOR HUMANS!



ODF Collaboration Resources

Resources

- **Website (in progress):**
<https://tdf.github.io/odftoolkit/docs/odfdom/operations/operations.html>
- **Sources:**
<https://github.com/tdf/odftoolkit>
- **3 Pages: The Next Millenium File Format**
- **ODF Specification**
<http://docs.oasis-open.org/office/v1.2/os/>