ODF Support in KWord 2

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About me

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Agenda

- Whirlwind tour of ODF
- KWord 2 ODF Text Design
- ODF Testing Framework
- What's cooking
- Questions
What is ODF?

- XML Format for spreadsheets, presentations, word documents
- Brief history
  - StarOffice (Sun) → OpenOffice.org → OASIS
- The spec is huge (~800 pages)
  - Cross references many other specs like XML, SVG, XSLT, XFORMS.
  - Surprisingly readable (damn...)
- For this preso, we care only about text documents
ODT

- Text documents are stored as .odt
- Can contain
  - Paragraphs
  - Lists
  - Tables
  - Frames
  - Sections
  - Graphical elements
  - Notes, annotations, ruby text, references, bookmarks, TOC, change log, ...
- Imagine lots of XML element names and attributes for the above
ODT File Contents

• Zip file contains the following
  – META-INF/manifest.xml (Contents of the zip file relevant to ODT and the mimetype)
  – meta.xml (Author, Creation date and so on)
  – settings.xml (Application settings)
  – content.xml (The content)
  – styles.xml (The styles i.e how the content looks)
• Content is kept separate from the style
  – Easy to extract contents
  – Styles can be reused
ODT Styles

- Classified by type/family
  - Paragraph styles
  - Character styles
  - List styles
  - Outline styles
  - Conditional styles
  - Section styles, Frame styles, ruby styles, note styles, annotation styles...
Styles

- Classified by concept
  - Default style
    - Used when an entity does not state a style
  - Named style
    - Styles that have "names" (style manager)
  - Master style
    - Styles for pages, header/footer
  - Automatic style
    - Styles created on the fly
- Styles can have a parent style
  - Attributes cascade
  - Automatic styles usually have a parent
ODT File contents

- **styles.xml**
  - Contains master styles, named styles, default styles
  - Contains automatic styles too...
- **content.xml**
  - Contains all the content
  - Automatic styles
KWord – KoStore

- Task: Unpacking the odt
- libs/store – Read/Write archives
- Also handles encrypted stores
  - Queries user for password, if need be
- Task: Extract contents of the archive

KoStore *store = KoStore::createStore(  
    "test.odt", KoStore::Read);  
store->open("content.xml");  
QIODevice *contentDevice = store->device();
• Task: Parsing XML
• We have our own DOM parser written for speed & memory usage
• API identical to QDom (meant to be a drop-in for Qt Dom)
• Main differences
  – Nodes are loaded on demand
  – Read only
  – No DTD handling
ODF Library - libs/odf

- Task: Process ODF documents
- Understands the ODF XML Schema
- Goal is to make it a library that can be used for processing ODF documents without requiring it to be rendered
- Use case: document processors, report generators
ODF Library - libs/odf

- Query style information of the document
- Push a style and its parents into a stack and query its properties (KoOdfStyleStack)
- Holds information about a style and query for existing style of the same format (KoGenStyle, KoGenStyles)
- Far from complete
  - Input/Output is mostly XML. User needs to know ODF
• Task: Load the text into a structure that can be drawn
• Qt 4 brings Qt Scribe (i.e. QTextDocument and friends)
• ODF has lots of features compared to Qt Scribe
  – Extend Qt Scribe
Qt Scribe

- Central class is QTextDocument
- A paragraph is a "block"
- Blocks are made of fragments
- A list is set of non-contiguous blocks
- Blocks, fragments, lists can have formats
  - QTextBlockFormat, QTextCharFormat, QTextListFormat
- QTextCursor can be used to manipulate text
  - cursor.insertText()
Extending Qt Scribe

- The formats are nothing but a QMap<int, QVariant>
- One can store arbitrary values in the formats
  - Store ODF specific properties in the format using custom keys in the QMap
Loading ODF

- Task: Load ODF into the QTextDocument

- All styles are parsed
  - Named and default styles are put in Style manager
  - Style manager generates a unique id for each named style
Loading the document (Text)

- Use QTextCursor to load text
- Applying styles
  - Convert ODF style to QTextFormat
  - Save the style id into the format's QMap
- That's it!
Edit/make changes to the document using QTextCursor (just like QTextEdit)
  – We throw away the DOM
When applying a named style, overwrite the existing format
When applying an automatic style, merge with the existing format
Saving the Document

- Write blocks one after the other
- Generate automatic styles for each block by
  - Diff'ing against the "StyleId" style
Lists

- Lists can be nested and have styles for different levels
  - QTextList does not support nested lists
- KoListStyle
  - Maintains a QTextList for each level
- At layout time, we generate the numbering for the list items
  - Complex stuff
Flake

- Text documents can have embedded content aka frames
  - Frames can be non-text
- Flake is a "shape" framework (Very similar to GraphicsView)
- A flake contains
  - shape(s) that can be placed on a canvas
  - Provides tools to modify the shapes
  - Shapes can load/save ODF
- It's plugin based
  - Textshape plugin for text handling
Layout

- Qt Scribe can be provided a custom layouter
- KWord has a custom layout to accommodate ODF features
- Allows run around of text (any shape for that matter) along painter paths
ODF Testing Framework

- **Goal:** Testsuite that can check if documents are loaded and saved correctly by ODF
- **Test cases from OpenDocument Fellowship**
- **Uses the QtScript binding generator (TT labs)**
- **Strategy**
  - Loading Document using kotext
  - Load document created by a script
  - Compare both documents
- **Does not check if the document is actually rendered correctly**
Current Status

- 1.6 already had good ODT support
  - Qt 3 Text document was forked and extended
- 2.0, lots of rewritten code
  - Moving to Scribe
  - Flake architecture
  - Lots and lots of code, with very little testing (like KDE 4.0, playing catch up with 1.6. We need help!
  - No plans to keep API BC after 2.0
What's cooking

- Style manager (Thomas)
- Headers, lists (Girish, Roop)
- TOC, Page layout (Peirre, Sebastien)
- Paragraph tool (Florian)

- There is a LOT of work to be done
  - Usable but not ready for user testing. There are lots of small bugs. We need developers who can test and fix
  - Tables
  - Many ODF features have no UI
  - KWord Audit has list of tasks TODO.
KWord and ODF spec

- Constant feedback to Oasis
  - Unfortunately, one needs to pay to be a member of Oasis
  - Channelled through David Faure and Thomas Zander
Questions?

Thank you!
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