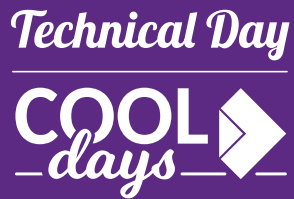


# Missing Fonts and Dynamic Font Downloading

Tor Lillqvist  
Software Engineer  
tml@collabora.com



Collabora  
Online





# The problem

- User loads a document in Collabora Online that uses fonts the COOL server doesn't have.
- Document looks bad.
- User blames Collabora Online.



# The solution

- Optionally tell the user what fonts are missing, “it’s not our fault”.
- And/or inform server admins about it.
- Or user informs their admin/service provider.
- Admins acquire the font and add it to the server. Restart of server not necessary. User is happy.



# More details

- Figuring out missing fonts is not straightforward.
- Which is not surprising.
- There are two different cases:
  - A font is missing completely.
  - A font exists but for some reason doesn't contain a glyph that the document wants to display from it.



# More details

- Can we get an information of missing fonts already when loading the document? No.
- Doesn't matter. Soon enough after loading the document we will know anyway, while the document is being rendered.
- Some year ago an API was added that can be used to track what fonts have been substituted:  
`OutputDevice::StartTrackingFontMappingUse()`  
and `FinishTrackingFontMappingUse()`.



# More details

- But there are some complications.
- A document format might just contain a typeface family name and a flag “italic”, “bold” etc.
- The above API reports the actual font being used as separate family and style name separated by a slash.
- Even for fonts that are not missing.



# More details

- For instance we learn that Liberation Serif has been substituted by Liberation Serif/Regular.
- The style names are completely arbitrary and typeface-specific, the “normal” one can be called Regular, Normal, Roman, Book or whatever.



# More details

- So just use bunch of heuristic to bypass these non-problems.
- If a “font” (really typeface) has been “substituted” by itself in a specific style, assume everything is OK.
- Also ignore well-known metric-compatible open-source substitutions of well-known proprietary fonts.





# Adding fonts

- We want the admins to be able to add fonts on the fly to the server.
- (Not on the fly to each editing session.)
- Will affect editing of documents started after that.



# Adding fonts

- Fonts to be added are listed in a JSON file.
- The coolwsd.xml file points to that JSON file.
- Checked for modifications once a minute.
- New fonts added will be downloaded.
- Also, a “tag” can be modified to indicate new version of a font file.



# coolwsd.xml fragment

```
<remote_font_config>  
  <url desc="URL of optional JSON  
    file that lists fonts to be included  
    in Online" type="string"default="">  
    http://localhost/tml/fonts.json  
  </url>  
</remote_font_config>
```



# Sample fonts.json

```
{  
  "kind": "fontconfiguration",  
  "server": "My pretty server name for admin console",  
  "fonts": [  
    {  
      "uri": "http://localhost/tml/MS33558.ttf"  
    },  
    {  
      "uri": "http://localhost/tml/XYZ.ttf",  
      "stamp": "foo1"  
    }  
  ]  
}
```



# Adding fonts

- Complications caused by the split between ForKit and Kit processes.
- We want the downloaded fonts to be visible only to the ForKit process.
- Kit processes run in chroot jails.



# Adding fonts

- Use an API in vcl to add a “temporary” font to core.
- But still the actual font file is opened in a multitude of places when glyphs are rendered by the Kit process, in external libraries.



# Adding fonts

- Thus we need to patch those libraries and use “bundled” version of them in a Collabora Office to be used in a Collabora Online installation with this font addition feature.
- We open the font file once, in ForKit, and the file descriptor is inherited by Kit processes.



# Adding fonts

- Instead of the real font file name we use a magic name that contains the file descriptor number.
- We patch the libraries to recognise this and just `dup()` the fd.
- Luckily the fact that there is just one shared file position does not seem to harm, the libraries uses the font file for a short time and there is no parallelism.



# Thank you!

*By Tor Lillqvist*

@CollaboraOffice  
hello@collaboraoffice.com  
www.collaboraoffice.com

