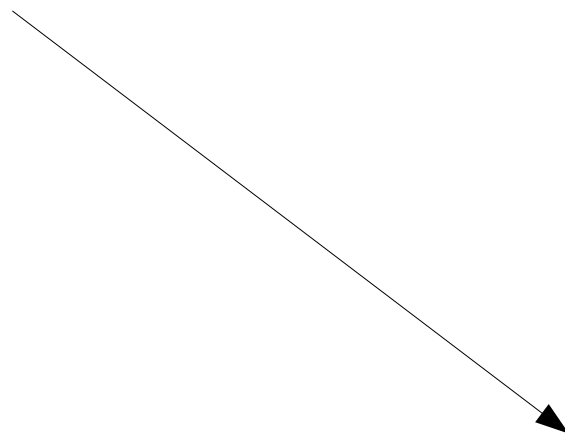


THRILLING DEVELOPMENTS
FROM THE FIELD OF
BORING FONT UTILITIES.

NATE WILLIS

NATE WILLIS



Not Joking.

A thrilling year

- Adobe FDK for OpenType
- FontTools / TTX
- MutatorMath
- etc.

A thrilling year

- Adobe FDK for OpenType!
- FontTools / TTX!
- MutatorMath!
- etc!

NOT those.

Two boring utilities!

Two boring utilities!

Emacs fontfile modes

roll-font-release

Emacs fontfile modes!

A set of five Emacs “major modes”
to help **YOU** with font-development file
formats.

Emacs fontfile modes!

A set of five Emacs “major modes”
to help **YOU** with font-development file
formats.

*Total estimated number of potential users
worldwide: 12.*

Emacs fontfile modes!

OpenType feature files (.fea)

UFO font glyphs (.glif)

FontTools TTX files (.ttx)

FontForge font files (.sfd)

FontForge native scripts (.ff and/or .pe)

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FontForge native scripts (.ff and/or .pe)

Emacs fontfile modes!

Syntax highlighting

Auto-indentation

Help documentation


```

#-----
table head {
    FontRevision 2.012;
} head;

#-----
table OS/2 {
    FSType 8;
    TypoAscender 727;
    TypoDescender -273;
    Panose 2 4 5 3 5 2 1 2 2 3;
    XHeight 438;
    CapHeight 651;
} OS/2;

#-----
# included from file /amd/eng/home/cslye/Release_2.012/Roman/Regular/../../features.name.
#-----
table name {
    nameid 0 "\00a9 2000, 2002, 2004 Adobe Systems Incorporated. All Rights Reserved. U.S. Patent D371,799.";
    nameid 0 1 "\a9 2000, 2002, 2004 Adobe Systems Incorporated. All Rights Reserved. U.S. Patent D371,799.";
    nameid 7 "Minion is either a registered trademark or a trademark of Adobe Systems Incorporated in the United States
and/or other countries.";
    nameid 7 1 "Minion is either a registered trademark or a trademark of Adobe Systems Incorporated in the United States
es and/or other countries.";
    nameid 9 "Robert Slimbach";
    nameid 9 1 "Robert Slimbach";
    nameid 11 "http://www.adobe.com/type/";
    nameid 11 1 "http://www.adobe.com/type/";
    nameid 14 "http://www.adobe.com/type/legal.html";
    nameid 14 1 "http://www.adobe.com/type/legal.html";
} name;

# end inclusion from file /amd/eng/home/cslye/Release_2.012/Roman/Regular/../../features.name.

#-----
# included from file /amd/eng/home/cslye/Release_2.012/Roman/Regular/../../features.family.

```

#-----

```

languagesystem latn dflt;
languagesystem cyrl dflt;
languagesystem grek dflt;
languagesystem latn AZE;
languagesystem latn CRT;
languagesystem latn DEU;
languagesystem latn MOL;
languagesystem latn ROM;
languagesystem latn SRB;
languagesystem latn TRK;

```

feature aalt {

```

    sub [@FIG_TAB_LINING @CURRENCY_TAB_LINING] by [@FIG_FIT_OLDSTYLE @CURRENCY_FIT_OLDSTYLE];
    sub [@FIG_TAB_LINING @CURRENCY_TAB_LINING] by [@FIG_FIT_LINING @CURRENCY_FIT_LINING];
    sub [@FIG_TAB_LINING @CURRENCY_TAB_LINING] by [@FIG_TAB_OLDSTYLE @CURRENCY_TAB_OLDSTYLE];

    sub [@FIG_FIT_OLDSTYLE @CURRENCY_FIT_OLDSTYLE] by [@FIG_TAB_LINING @CURRENCY_TAB_LINING];
    sub [@FIG_FIT_OLDSTYLE @CURRENCY_FIT_OLDSTYLE] by [@FIG_FIT_LINING @CURRENCY_FIT_LINING];
    sub [@FIG_FIT_OLDSTYLE @CURRENCY_FIT_OLDSTYLE] by [@FIG_TAB_OLDSTYLE @CURRENCY_TAB_OLDSTYLE];

    sub [@FIG_FIT_LINING @CURRENCY_FIT_LINING] by [@FIG_TAB_LINING @CURRENCY_TAB_LINING];
    sub [@FIG_FIT_LINING @CURRENCY_FIT_LINING] by [@FIG_FIT_OLDSTYLE @CURRENCY_FIT_OLDSTYLE];
    sub [@FIG_FIT_LINING @CURRENCY_FIT_LINING] by [@FIG_TAB_OLDSTYLE @CURRENCY_TAB_OLDSTYLE];

    sub [@FIG_TAB_OLDSTYLE @CURRENCY_TAB_OLDSTYLE] by [@FIG_TAB_LINING @CURRENCY_TAB_LINING];
    sub [@FIG_TAB_OLDSTYLE @CURRENCY_TAB_OLDSTYLE] by [@FIG_FIT_OLDSTYLE @CURRENCY_FIT_OLDSTYLE];
    sub [@FIG_TAB_OLDSTYLE @CURRENCY_TAB_OLDSTYLE] by [@FIG_FIT_LINING @CURRENCY_FIT_LINING];

```

#-[italic] sub @SWASH_OFF by @SWASH_ON;

```

    sub a by ordfeminine;
    sub o by ordmasculine;
    sub numbersign by numbersign.oldstyle;
    sub hyphen from [endash emdash hyphen.cap hyphen.superior hyphen.inferior hyphen.numerator hyphen.denominator figure
edash threequartersemdash minus];
    sub hyphen.cap from [endash.cap emdash.cap];
    sub period from [ellipsis period.superior period.inferior period.numerator period.denominator onedotenleader twodot
enleader];
    sub zero.slash from [zero.fitted zero.oldstyle zero.taboldstyle zero.superior zero.inferior zero.numerator zero.den

```

```

sub zero.slash by zero.taboldstyle;
sub zero.slashfitted by zero.oldstyle;
sub numbersign by numbersign.taboldstyle;
sub numbersign.fitted by numbersign.oldstyle;
sub percent by percent.oldstyle;
sub perthousand by perthousand.oldstyle;
sub estimated by estimated.oldstyle;
} c2sc;

#-----
feature smcp {

  script latn;
  language dflt;
  lookup SMCP_DFLT {
    sub i by i.sc;
  } SMCP_DFLT;

  lookup SMCP_ALL {
    sub @LETTERS_LC by @LETTERS_SC;
    sub dotlessi by dotlessi.sc;
    sub uni021B by tcommaaccent.sc; # dblmap override
    sub germandbls by germandbls.sc;
    sub [f_i f_l] by [f_i.sc f_l.sc];
    sub @FIG_TAB_LINING by @FIG_TAB_OLDSTYLE;
    sub @FIG_FIT_LINING by @FIG_FIT_OLDSTYLE;
    sub @CURRENCY_TAB_LINING by @CURRENCY_TAB_OLDSTYLE;
    sub @CURRENCY_FIT_LINING by @CURRENCY_FIT_OLDSTYLE;
    sub @ACCENTS_LC by @ACCENTS_SC;
    sub zero.slash by zero.taboldstyle;
    sub zero.slashfitted by zero.oldstyle;
    sub commaaccent by commaaccent.sc;
    sub [ampersand exclam question exclamdown questiondown] by [ampersand.sc exclam.sc question.sc exclamdown.sc questiondown.sc];
    sub numbersign by numbersign.taboldstyle;
    sub numbersign.fitted by numbersign.oldstyle;
    sub percent by percent.oldstyle;
    sub perthousand by perthousand.oldstyle;
    sub estimated by estimated.oldstyle;
  } SMCP_ALL;
}

```

```

lookup SMCP_DFLT {
    sub i by i.sc;
} SMCP_DFLT;

lookup SMCP_ALL {
    sub @LETTERS_LC by @LETTERS_SC;
    sub dotlessi by dotlessi.sc;
    sub uni021B by tcommaaccent.sc; # dblmap override
    sub germandbls by germandbls.sc;
    sub [f_i f_l] by [f_i.sc f_l.sc];
    sub @FIG_TAB_LINING by @FIG_TAB_OLDSTYLE;
    sub @FIG_FIT_LINING by @FIG_FIT_OLDSTYLE;
    sub @CURRENCY_TAB_LINING by @CURRENCY_TAB_OLDSTYLE;
    sub @CURRENCY_FIT_LINING by @CURRENCY_FIT_OLDSTYLE;
    sub @ACCENTS_LC by @ACCENTS_SC;
    sub zero.slash by zero.taboldstyle;
    sub zero.slashfitted by zero.oldstyle;
    sub commaaccent by commaaccent.sc;
    sub [ampersand exclam question exclamdown questiondown] by [ampersand.sc exclam.sc question.sc exclamdown.s
sc questiondown.sc];
    sub numbersign by numbersign.taboldstyle;
    sub numbersign.fitted by numbersign.oldstyle;
    sub percent by percent.oldstyle;
    sub perthousand by perthousand.oldstyle;
    sub estimated by estimated.oldstyle;
} SMCP_ALL;

language DEU include_dflt;
language MOL include_dflt;
language ROM include_dflt;
language SRB include_dflt;

language AZE exclude_dflt;
lookup SMCP_TURK {
    sub i by idotaccent.sc;
} SMCP_TURK;
lookup SMCP_ALL;

language CRT exclude_dflt;
lookup SMCP_TURK;
lookup SMCP_ALL;

```

File Edit Options Buffers Tools Help

```
OS2WinDescent: 0
OS2WinDOffset: 1
HheadAscent: 0
HheadAOffset: 1
HheadDescent: 0
HheadDOffset: 1
OS2Vendor: 'PfEd'
DEI: 91125
LangName: 1033
Encoding: ISO8859-1
UnicodeInterp: none
NameList: Adobe Glyph List
DisplaySize: -24
AntiAlias: 1
FitToEm: 1
WinInfo: 0 21 13
Grid
-1000 556 m 0
 2000 556 l 0
  Named: "x-height"
EndSplineSet
TeXData: 1 0 0 346030 173015 115343 0 1048576 115343 783286 444596 497025 792723 393216 433062 380633 303038 157286 324010
404750 52429 2506097 1059062 262144
BeginChars: 256 18

StartChar: a
Encoding: 97 97 0
Width: 567
VWidth: 0
Flags: W
HStem: -7 57<165.125 304.911> 1 21G<402 477> 308 59<311.37 393> 505 57<199.063 350.469>
VStem: 70 69<78.2947 208.76> 393 68<2.05437 90 118.625 308 362.942 460.545>
LayerCount: 2
Fore
SplineSet
70 140 m 0xbc
 70 142 70 145 70 147 c 0
 70 294 252 339 394 367 c 1
 394 369 394 372 394 374 c 0
 394 463 356 505 273 505 c 0
 272 505 271 505 270 505 c 0
---:--- Newsworthy-Regular.sfd 14% L76 (FontForge SFD ElDoc)-----
```



```
<?xml version="1.0" encoding="UTF-8"?>
<glyph name="a10" format="1">
  <advance width="692"/>
  <outline>
    <contour>
      <point x="346" y="702" type="line"/>
      <point x="240" y="520" type="line"/>
      <point x="35" y="520" type="line"/>
      <point x="137" y="346" type="line"/>
      <point x="35" y="169" type="line"/>
      <point x="240" y="169" type="line"/>
      <point x="346" y="-14" type="line"/>
      <point x="451" y="169" type="line"/>
      <point x="657" y="169" type="line"/>
      <point x="555" y="346" type="line"/>
      <point x="657" y="520" type="line"/>
      <point x="451" y="520" type="line"/>
    </contour>
    <contour>
      <point x="262" y="487" type="line"/>
      <point x="430" y="487" type="line"/>
      <point x="512" y="346" type="line"/>
      <point x="430" y="202" type="line"/>
      <point x="262" y="202" type="line"/>
      <point x="180" y="346" type="line"/>
    </contour>
    <contour>
      <point x="346" y="630" type="line"/>
      <point x="408" y="520" type="line"/>
      <point x="283" y="520" type="line"/>
    </contour>
    <contour>
      <point x="473" y="487" type="line"/>
      <point x="594" y="487" type="line"/>
      <point x="534" y="384" type="line"/>
    </contour>
    <contour>
      <point x="534" y="307" type="line"/>
      <point x="593" y="202" type="line"/>
      <point x="474" y="202" type="line"/>
    </contour>
  </outline>
</glyph>
```

File Edit Options Buffers Tools Help

```
#!/usr/bin/env fontforge
# $Id: narrowmerge.pe 2049 2007-10-28 22:43:15Z ben_laenen $

# script file for FontForge for font narrowing after merge
# usage: fontforge -script narrowmerge.pe scale sfd glyph_codes*
#   created file has suffix .narrow

# DejaVu Condensed have scale 90

if ($version < "20050209")
    Error("Your version of FontForge transforms glyphs w/o content");
endif
if ($argc < 3)
    Error("usage: scale sfd glyph_codes...")
endif
scale = Strtol($argv[1])
file = $argv[2]
if ($argc < 4)
    Print("Nothing to do for ", file)
    Quit(0)
endif
Open(file, 1)
i = 3
while (i < $argc)
    Select(Strtol($argv[i]))
    ref_count = GlyphInfo("RefCount")
    if (ref_count == 0)
        Scale(scale, 100, 0, 0)
    else
        Print(GlyphInfo("Name"), " contains references: not scaled")
    endif
    i++
endloop
Save(file + ".narrow")
```

--:--- narrowmerge.pe All L1 (FontForge script)-----

```
<?xml version="1.0" encoding="UTF-8"?>
<glyph name="a10" format="1">
  <advance width="692"/>
  <outline>
    <contour>
      <point x="346" y="702" type="line"/>
      <point x="240" y="520" type="line"/>
      <point x="35" y="520" type="line"/>
      <point x="137" y="346" type="line"/>
      <point x="35" y="169" type="line"/>
      <point x="240" y="169" type="line"/>
      <point x="346" y="-14" type="line"/>
      <point x="451" y="169" type="line"/>
      <point x="657" y="169" type="line"/>
      <point x="555" y="346" type="line"/>
      <point x="657" y="520" type="line"/>
      <point x="451" y="520" type="line"/>
    </contour>
    <contour>
      <point x="262" y="487" type="line"/>
      <point x="430" y="487" type="line"/>
      <point x="512" y="346" type="line"/>
      <point x="430" y="202" type="line"/>
      <point x="262" y="202" type="line"/>
      <point x="180" y="346" type="line"/>
    </contour>
    <contour>
      <point x="346" y="630" type="line"/>
      <point x="408" y="520" type="line"/>
      <point x="283" y="520" type="line"/>
    </contour>
    <contour>
      <point x="473" y="487" type="line"/>
      <point x="594" y="487" type="line"/>
      <point x="534" y="384" type="line"/>
    </contour>
    <contour>
      <point x="534" y="307" type="line"/>
      <point x="593" y="202" type="line"/>
      <point x="474" y="202" type="line"/>
    </contour>
  </outline>
</glyph>
```



```

<mtx name="zcaron" width="779" lsb="25"/>
<mtx name="zcircumflex" width="779" lsb="25"/>
<mtx name="zdotaccent" width="779" lsb="25"/>
<mtx name="zdotbelow" width="779" lsb="25"/>
<mtx name="ze" width="949" lsb="80"/>
<mtx name="zecedilla" width="954" lsb="80"/>
<mtx name="zedieresis" width="949" lsb="80"/>
<mtx name="zero" width="1135" lsb="80"/>
<mtx name="zero.superior" width="521" lsb="100"/>
<mtx name="zero.text" width="1125" lsb="75"/>
<mtx name="zeta" width="828" lsb="75"/>
<mtx name="zhe" width="1184" lsb="25"/>
<mtx name="zhebreve" width="1184" lsb="25"/>
<mtx name="zhedescender" width="1213" lsb="25"/>
<mtx name="zhedieresis" width="1184" lsb="25"/>
<mtx name="zhook" width="779" lsb="25"/>
<mtx name="zlinebelow" width="779" lsb="25"/>
<mtx name="zswashtail" width="779" lsb="25"/>
</hmtx>

<cmmap>
  <tableVersion version="0"/>
  <cmmap_format_4 platformID="0" platEncID="3" language="0">
    <map code="0xd" name="nonmarkingreturn"/><!-- <control> -->
    <map code="0x20" name="space"/><!-- SPACE -->
    <map code="0x21" name="exclam"/><!-- EXCLAMATION MARK -->
    <map code="0x22" name="quotedbl"/><!-- QUOTATION MARK -->
    <map code="0x23" name="numbersign"/><!-- NUMBER SIGN -->
    <map code="0x24" name="dollar"/><!-- DOLLAR SIGN -->
    <map code="0x25" name="percent"/><!-- PERCENT SIGN -->
    <map code="0x26" name="ampersand"/><!-- AMPERSAND -->
    <map code="0x27" name="quotesingle"/><!-- APOSTROPHE -->
    <map code="0x28" name="parenleft"/><!-- LEFT PARENTHESIS -->
    <map code="0x29" name="parenright"/><!-- RIGHT PARENTHESIS -->
    <map code="0x2a" name="asterisk"/><!-- ASTERISK -->
    <map code="0x2b" name="plus"/><!-- PLUS SIGN -->
    <map code="0x2c" name="comma"/><!-- COMMA -->
    <map code="0x2d" name="hyphen"/><!-- HYPHEN-MINUS -->
    <map code="0x2e" name="period"/><!-- FULL STOP -->
    <map code="0x2f" name="slash"/><!-- SOLIDUS -->
    <map code="0x30" name="zero"/><!-- DIGIT ZERO -->
  
```

```
<mtx name="zcaron" width="779" lsb="25"/>
<mtx name="zcircumflex" width="779" lsb="25"/>
<mtx name="zdotaccent" width="779" lsb="25"/>
<mtx name="zdotbelow" width="779" lsb="25"/>
<mtx name="ze" width="949" lsb="80"/>
<mtx name="zecedilla" width="954" lsb="80"/>
<mtx name="zedieresis" width="949" lsb="80"/>
<mtx name="zero" width="1135" lsb="80"/>
<mtx name="zero.superior" width="521" lsb="100"/>
<mtx name="zero.text" width="1125" lsb="75"/>
<mtx name="zeta" width="828" lsb="75"/>
<mtx name="zhe" width="1184" lsb="25"/>
<mtx name="zhebreve" width="1184" lsb="25"/>
<mtx name="zhedescender" width="1213" lsb="25"/>
<mtx name="zhedieresis" width="1184" lsb="25"/>
<mtx name="zhook" width="779" lsb="25"/>
<mtx name="zlinebelow" width="779" lsb="25"/>
<mtx name="zswashtail" width="779" lsb="25"/>
</hmtx>
```

```
<cmapp>...</cmapp>
```

```
<fpgm>
  <assembly>
    PUSHB[ ] /* 1 value pushed */
    0
    FDEF[ ]
    PUSHB[ ] /* 1 value pushed */
    0
    SZP0[ ]
    MPPEM[ ]
    PUSHB[ ] /* 1 value pushed */
    42
    LT[ ]
    IF[ ]
    PUSHB[ ] /* 1 value pushed */
    74
    SROUND[ ]
    EIF[ ]
    PUSHB[ ] /* 1 value pushed */
    0
```

Emacs fontfile modes!

Syntax highlighting

Auto-indentation

Help documentation

*... including OpenType and TrueType
specification info !!!*

Emacs fontfile modes!

TTX and UFO .glif files get more!

Element folding!

Validation! Whether you want it or not!

Schemas schemas schemas!

Enough talk!

**I demand that you tell me
how I can use them!!!**

First you have to get them

glyphography.com/software

github.com/n8willis/fontfile-modes

In a running Emacs...

In a running Emacs...

1. Open the file of interest
(e.g., fontfile-fea-mode.el)
2. Type M-x eval-buffer

To permanentify...

1. Save everything locally
(e.g., in ~/.emacs.d/)

2. Load it from your .emacs file

```
(add-to-list 'load-path "~/.emacs.d/fontfile-fea-  
mode.el")  
(require 'fontfile-fea-mode)
```

If you are running Vim...

If you are running Vim...

1. Type ESC :q! RETURN

2. Type emacs &

What you **really** care about

Somebody actually ought to document
your file format.

What you **really** care about

None of the letters in XML stand for
“brevity.”

What you **really** care about

Never tell yourself you're going to fix the file format later.

What you **really** care about

Nevertheless, Emacs major modes are
a great stress test.

What you **really** care about

Nevertheless, Emacs major modes are a great stress test ... and they can generate benefits for everyone around the world.

WHAT NEXT?

YOU TELL ME.

WHAT NEXT?

More file formats (like GDL or CPS)?

Other editors (ACE)?

Other features?

Fix all the horribly broken garbage?

MOVing on...

Chapter two:

roll-font-release

Chapter two:

roll-font-release

...which is, sadly, not written in Lisp.

Chapter two:

roll-font-release

...which answers the question “what version do you have anyway?”

fonts on linux
bite

USING fonts on linux bite(s)

BUG Triage process

Q: Hey. I really like this font, *but...*

BUG Triage process

Q: Hey. I really like this font, *but...*

A: It's not me, it's you.

BUG Triage process

Q: Hey. I really like this font, *but...*

A: Where did you get it?

correct procedure for installing a font in linux

1. Download .zip file
2. Open it in file-roller
3. Try to extract it to a hidden folder
4. Give up and open a terminal
5. Go back to file-roller; save elsewhere
6. Go back to terminal; use “mv”
7. Go back to browser, Google for “install font”
8. Go back to terminal, use fontconfig command

correct procedure for installing a font in linux

10. Swear at ceiling for not saving
11. Re-open all your applications
12. Hunt through the Font selector
looking for
something familiar.

correct procedure for installing a font in linux

10. Swear at ceiling for not saving
11. Re-open all your applications
12. Hunt through the Font selector
looking for
something familiar.

(Updating is the same, except you have two identical entries in the selector during step 12)

correct procedure for installing a font in linux

There may be room for improvement
somewhere.

mac users have font managers

We do not.



root problems

Applications don't think about
updateable fonts

Fonts are not delivered as packages

Metadata is not accessible

rolling a release

Take generated .otf or ttf files
(hopefully related ones)

Build RPM, Debian, and CTAN packages
with proper versioning, contact info,
and other metadata.

rolling a release

Currently only guaranteed to work if you are Nate Willis.

rolling a release

Currently only guaranteed to work if you are Nate Willis.

Not clear if it *needs* to be generalized....

rolling a release

Currently only guaranteed to work if you are Nate Willis.

Not clear if it *needs* to be generalized...

...but other build tools can also do better.

rolling a release

Other work: AppData, packagers, Google Fonts build scripts, GNOME font manager, etc.

GitHub and Open Font Library could do more to catch up.

rolling a release

Type designers have adapted to thinking of fonts as software.

Packages are the next step.

what will
you
do?