# Fonts in X11R7.7

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X Version 11, Release 7.7

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# Table of Contents


L
L
L
L
2
4
4
K
K
/
/
1
/K
/K
/K
/
/

! " #
$ $
! "
% & ' ( )
"
*
*## )+ " ,
#
- - ( .
$

# Introduction

" ##

" ##

0 -#
*## )+" , " ,

## Two font systems

+ - #
# - - " "
# " 12 2 1

3
41 - " # 53 -
" ## "
#

# 3 ## " -
$ , - ##
"#) 6 # # - 3 ##
3 # - , # 07! 0 8
# # " - ##
# "

# " + 9 )
3 , : " ; 0 5
- ,
# "

# Installing fonts

)# "

## Configuring Xft

- # < #+==
= > " "
# 0 - # #

### Installing fonts in Xft

, ,
? : @/usr/share/fonts/X11/*A; " ;
@.fonts/A ?
" ## # #

```
$ cp lucbr.ttf ~/.fonts/
```

```
                    ) ##       "
                #            -
        @        A
```

```
$ fc-cache
```

```
      "   #                    $ )    -
     #                  +
```

```
$ su -c fc-cache
```

## Fine-tuning Xft

```
    ? " 3         "              +
      -      @/etc/fonts/fonts.confA-    #           -              @/etc/
fonts/local.confA-       #                      @.fonts.confA       ?
      :    " 3                              @FONTCONFIG_FILEA 3
3  " ;
```

```
B3                            "  #  +
```

```
<?xml version="1.0"?>
<!DOCTYPE fontconfig SYSTEM "fonts.dtd">
<fontconfig>
```

```
    - 3                              +
```

```
</fontconfig>
```

```
                                                          @~/.fonts/A
                  -           #
   "          ,                 "   -
    "             )+
```

```
<dir>/usr/local/share/fonts/</dir>
```

```
*      #      "      "       :      ;
          "             )+
```

```
<match target="font">
    <test qual="any" name="family">
        <string>Lucida Console</string>
    </test>
    <edit name="antialias" mode="assign">
        <bool>false</bool>
    </edit>
```

```
</match>

*       "   "        "            +


<match target="font">
    <edit name="antialias" mode="assign">
        <bool>false</bool>
    </edit>
</match>

  ##   "#)         (.  #
 "          # #          (.
.C  " D      ,          "  #


$ xdpyinfo -ext RENDER | grep sub-pixel

     ? #      -                  #
(.        D                 )+


<match target="font">
    <edit name="rgba" mode="assign">
        <const>rgb</const>
    </edit>
</match>

         @rgbA          @<const>A  @</const>A #          #)
#         # -      "                D
"        @rgbA:   (.   ;-           @bgrA:" ,   (.   ;-            @vrgbA:(.
        ,  ;                @vbgrA:(.            ,  ;
```

## Configuring applications

```
*      "   ##          #
!  ##    -  3 -    "  )#

*    #      -     "        "                                  @-faA
   #   "                  @XTerm*faceNameA    +


XTerm*faceName: Courier




$ xterm -fa "Courier"

  E.B  ##     -                          @*        A              @   A   #
E.B?   @        A        F       #        +       E.B
  "    ?  "                  "  "


8   ##        G      )       "
```

# Configuring the core X11 fonts system

## Installing bitmap fonts

```
$ bdftopcf courier12.bdf
```

```
$ gzip courier12.pcf
```

```
$ mkdir /usr/local/share/fonts/bitmap/
$ cp *.pcf.gz /usr/local/share/fonts/bitmap/
$ mkfontdir /usr/local/share/fonts/bitmap/
```

## Installing scalable fonts

```
$ mkfontscale /usr/local/share/fonts/Type1/
$ mkfontdir /usr/local/share/fonts/Type1/
```

```
$          -    "                                          @fonts.scaleA
     "                    D          - #                          ,   :;
<,              >    ,    :;       <,                >    #
```

## CID-keyed fonts

```
   .,                " * " !
          .,        "   -     "   #    "
        5#   # =     ##     .,       "    3
```

## Setting the server's font path

```
                    3    ,        ,
        3      )                      #
      #

     #            D       ?   9          #     -
          #                0          -    3
 ,   #    3      #  +          #  -          )
   D          -                "

  "      -    "         ##         #   "      "   #
   D     -     3     #    "   #        "          )
     #   " - "     3       "   #          "       "
   :        @:unscaledA  ,-        ##   -          "
      ;
```

```
7      ,     #           3  "   #
```

```
$ xset q
```

### Font path catalogue directories

```
7    #     #    ,      #                                        catalogue:<dir>
       #                        catalogue: #  )   "          ,
     ,         "            #

     ,   "    )  "    "       ?                      unscaled?-      " #
                #           ) #
   ?    pri?    " -       "              #    #     "
     ,

* ) #        +
```

```
          75dpi:unscaled:pri=20 -> /usr/share/X11/fonts/75dpi
          ghostscript:pri=60 -> /usr/share/fonts/default/ghostscript
          misc:unscaled:pri=10 -> /usr/share/X11/fonts/misc
          type1:pri=40 -> /usr/share/X11/fonts/Type1
          type1:pri=50 -> /usr/share/fonts/default/Type1
```

```
            /usr/share/X11/fonts/misc        #
 "     unscaled          9 3              # +


          /usr/share/X11/fonts/misc:unscaled,
          /usr/share/X11/fonts/75dpi:unscaled,
          /usr/share/X11/fonts/Type1,
          /usr/share/fonts/default/Type1,
          /usr/share/fonts/default/ghostscript
```

### Temporary modification of the font path

```
    @    A      "            #
  #                                  D
       -                                  ) # -


$ xset +fp /usr/local/fonts/Type1
$ xset fp+ /usr/local/fonts/bitmap

 3   -       "   3             #                                    @
   A-     3                        @       A 7          #
    3            @              A

        - #                          ) : ;    <)          >    #
```

### Permanent modification of the font path

```
        #  :       H       3     #                                @
     A;   "  #          3 ?                @xorg.confA       #   "  #
#                                          @FontPathA            @FilesA
                ##        #    #            -
   3         3   #          "


FontPath "/usr/local/fonts/Type1"
...
FontPath "/usr/local/fonts/bitmap"

         - #                          )    :I;       <)     I          >
#
```

## Troubleshooting

```
       "   "                3      -
   ,              @fonts.dirA                    "  "
 3  :     3          -"     F !            ;
      ?   #-    9   #   "
       ##    "      3

     ##     %.-6 -!F-  #  -    # -   5#   #
' 3 -          3              " ,

5    #     -        3            " ,
                "        ##      #
    # 3   "        +
```

J "bitmap"+" # : @*.bdfA- @*.pcfA @*.snfA;D

J "freetype"+ # : @*.ttfA @*.ttcA;-5# # : @*.otfA
@*.otcA; #W : @*.pfaA @*.pfbA;

# Fonts included with X11R7.7

## Standard bitmap fonts

! # # :!; " " # -
@fixedA - " #3 - -'3
" (

- " # 3 $
* " - #
- # # 3 "
# ,

) # -

/usr/share/fonts/X11/misc/6x13.bdf

(.

-misc-fixed-medium-r-semicondensed--13-120-75-75-c-60-iso10646-1

$ 3 @fixedA ##
( -8 ,- -8 -* - 6* # #
" 3 /1KK # - 3 !5W11I4
# I- K- L I- B # % # -E5 1-
08(M- #

"

6x13-ISO8859-1.bdf
6x13-ISO8859-2.bdf
...
6x13-ISO8859-15.bdf
6x13-KOI8-R.bdf

# 3 (.

-misc-fixed-medium-r-normal--13-120-75-75-c-60-iso8859-1
...
-misc-fixed-medium-r-normal--13-120-75-75-c-60-iso8859-15
-misc-fixed-medium-r-normal--13-120-75-75-c-60-koi8-r

@fixedA

-misc-fixed-medium-r-normal--13-120-75-75-c-60-iso8859-1

# The ClearlyU Unicode font family

$ # 3 /W# - KKW # # #
# $ ) - ## )
IKK #

$ ( .

```
-mutt-clearlyu-medium-r-normal--17-120-100-100-p-101-iso10646-1
```

```
/usr/share/fonts/X11/misc/cu12.pcf.gz
```

* $

```
-mutt-clearlyu alternate glyphs-medium-r-normal--17-120-100-100-p-91-iso10646-1
-mutt-clearlyu pua-medium-r-normal--17-120-100-100-p-111-iso10646-1
-mutt-clearlyu arabic extra-medium-r-normal--17-120-100-100-p-103-fontspecific-0
-mutt-clearlyu ligature-medium-r-normal--17-120-100-100-p-141-fontspecific-0
```

# #
* # " # 3
# : $ ;

) # # #

# ? 3
# " # !5W K2M2 #
!5W K2M2

3 # "
# 3 # )

# Standard scalable fonts

" " 2

## Standard Type 1 fonts

% 3 !5W 11I4 !5W 11I4 / * "
! B 3 ( .

```
-adobe-courier-medium-*-*--0-0-0-0-m-0-*-*
```

```
/usr/share/fonts/X11/Type1/cour*.pfa
```

* " $ # 3 !5W 11I4 * " !
B 3 ( .

```
-adobe-utopia-*-*-normal--0-0-0-0-p-0-iso8859-1



/usr/share/fonts/X11/Type1/UT*.pfa

   -              # W 3       %
       3  ( .


-bitstream-courier-*-*-normal--0-0-0-0-m-0-iso8859-1
-bitstream-charter-*-*-normal--0-0-0-0-p-0-iso8859-1



/usr/share/fonts/X11/Type1/c*bt_.pfb
```

# The Bigelow & Holmes Luxi family

```
                                    "     -   "      #      # W
                                                    -    ( .


-b&h-luxi serif-medium-*-normal--*-*-*-*-p-*-*-*

         -    ( .


-b&h-luxi sans-medium-*-normal--*-*-*-*-p-*-*-*

              -    ( .


-b&h-luxi mono-medium-*-normal--*-*-*-*-m-*-*-*

B                 - " 9 -"     "   " 9  3
 # 3      3   #   3      "   *!  $       -   (   W     -
                                                    #
  #      -                    #          !5W11I4 #     - /- L-
M- 4-  L     I-               #       * " !
0     L

    #   3          # W  3                -         3
 !5W11I4 #     - /     I          * " !

  ( )                 " E   '           %     ( )
        -       -      #       -          " 9 -
    "                       - )     -  #       -
      -     #

                ( )        "
"       # #    #
```

( ) @COPYRIGHT.BHA-
(

% E ' % ' 3 # ( )
# ,

$ 0NN . . 3 # 8 "' 3 ,
# # # # O O ,
" ( )

- # <design@bigelowandholmes.com>
<info@urwpp.de>- $ 0NN " < #+== ## >

* 3 ( ) 3 "
" , -
3 " 3

# More about core fonts

" 12
# " 5

## Core fonts and internationalisation

" " , : # W #;
# ( . @fonts.dirA ) # - @fonts.dirA
# W

```
cour.pfa -adobe-courier-medium-r-normal--0-0-0-0-m-0-iso8859-1
cour.pfa -adobe-courier-medium-r-normal--0-0-0-0-m-0-iso8859-2
```

" !5W11I4 !5W11I4 / # 3

### The *fontenc* layer

" " , : # W ! " # " , ;
" ,
- # #
#

# # : ; " ,
" # " ,

- " : iso8859-1;-# "
" : ;- ## *
## " ##
, D - $ -* " # -
" # @ #A

* " - 3
" D " +

J iso10646-1+ $ D

J iso8859-1+ !5W( :0 B # ;D

J iso8859-2+ !5W( / :B B # ;D

J iso8859-3+ !5W( L :! B # ;D

J iso8859-4+ !5W( M :F B # ;D

J iso8859-5+ !5W D

J iso8859-6+ !5W* " D

J iso8859-7+ !5W8 ,D

J iso8859-8+ !5W' " D

J iso8859-9+ !5W( I : , ;D

J iso8859-10+ !5W( 2 :F ;D

J iso8859-15+ !5W( 4- ( K : 3 0 B # ;D

J koi8-r+ E5 1 D

J koi8-u+ E5 1 $, : /L 4;D

J koi8-ru+ E5 1 =$, D

J koi8-uni+ E5 1 @$ A : - $, - % ;D

J koi8-e+ E5 1 @B # -A !5 - B * D

J microsoft-symbol apple-roman+ , "
# "

* " " 0
9 ? , " - " , ,
: fonts.dirP;
@encodings.dirA - 9
- 3 @ A -
3 , @-eA # "
- " " @encodings.dirA 6
, :; <, > #

* "
"

## Backend-specific notes about fontenc

### The *FreeType* backend

# 5# # - # " , ##
## 6 ! # D ## #
$ , # ## "
##

# W - # " , ##
6 ! # - 5 - " , ##
$ - # " " ##

# F " 3 # $ #
3 " " * "

!# 3 adobe-fontspecific # W "
" :
' " " " ;

" ## - # " , !5W11I4

## Format of encoding directory files

" , , " -
3 @encodings.dirA
: @/usr/share/fonts/X11/encodings/A"
;

@encodings.dirA @fonts.dirA #
" - 3 3 -
- D " 3
- " B3
) # -

```
3
mulearabic-0 /usr/share/fonts/X11/encodings/mulearabic-0.enc
mulearabic-1 /usr/share/fonts/X11/encodings/mulearabic-1.enc
mulearabic-2 /usr/share/fonts/X11/encodings/mulearabic-2.enc
```

$ " # ? @STARTENCODINGA
@ALIASA @encodings.dirA

# ## : # "" ;- " #
G ##

@encoding.dirA " " @ A 6
, :; <, > #

## Format of encoding files

@ -A # 9 3
# E # 3 -
@sizeA @SIZEA @SiZEA # , D -
#

F " " - @256A ) - @0x100A
- @0400A

" @#A * @#A ## #
- @#A - #

- # "
: ;+

```
STARTENCODING mulearabic-0
ALIAS arabic-0
```

" " ( .
- ) @-A

# G
: !5W11I4 ;- ! QB # ) # +

```
SIZE 0x2B
```

) - # " "
# - - " #
@jisx0208.1990-0A:R !W WK/K1: 44K;- " " - " ;-
"

```
SIZE 0x75 0x80
```

) - @FIRSTINDEXA " #
# ) , @FIRSTINDEXA "
- " " " +

```
FIRSTINDEX 0x20 0x20
```

- @FIRSTINDEXA 3
3 - " "

F " , @FIRSTINDEXA
" # - , " 3
"

" @SIZEA @FIRSTINDEXA
" B G /I2
:K) KK; G 2 "

0 ## * ##
@STARTMAPPINGA ## " +

J $ : !5W K2M2;+

```
  STARTMAPPING unicode
```

J 3 # @ #A +

```
  STARTMAPPING cmap 3 1
```

J 6 ! # # +

```
  STARTMAPPING postscript
```

B3 ## # "
## ## $ # ## -
## +

```
0x21 0x0660
0x22 0x0661
...
```

```
*   "" 3   -   #  "    #
*
```

```
<it/start/ <it/end/ <it/target/
```

```
   "" 3
```

```
start     target
```

```
start+1   target+1
```

```
...
```

```
end       target+end-start
```

```
  ) # -
```

```
0x2121 0x215F 0x8140
```

```
   "" 3
```

```
0x2121 0x8140
0x2122 0x8141
...
0x215F 0x817E
```

```
              #         :
3  ;       3          ## -     #
  "      "                  @UNDEFINEA  +
```

```
UNDEFINE 0x00 0x2A
```

```
 -        -
```

```
UNDEFINE 0x1234
```

```
6  !  #  ##          B3       6  !  #  ##   #
    #
```

```
0x41 A
0x42 B
```

```
...

      )#

* ##                          ENDMAPPING


ENDMAPPING

*       ##    3 "     -                                    ENDENCODING


ENDENCODING

      ,     )           #  " -
 ,  ,            -     ##           ,
```

## Using symbol fonts

```
 # W   "        "                                adobe-fontspecific

       -     #  "       "                                                  mi-
crosoft-symbol     apple-roman      *  "     "    -  3 -
     ,     D        "                                  microsoft-cp1252- -
       -       microsoft-win3.1

                  : #    "     # W      #
3            ;-    #  "        #           3
           "                          ZapfDingbats   D              @encod-
ings/adobe-dingbats.encA
```

## Hints about using badly encoded fonts

```
*  "     )
  "    -        ,        )     #  ##    ,
0     )                    )
                  ?  G       #    D        -
  # #                3           #
     * "   #

                     +
        -
```

### Using fonts with the designer's encoding

```
        # W    -            #            D
       9    "                      @adobe-fontspecificA        (.
  !    -              #       "
 -              )#                          @adobe-standardA- @iso8859-1A-
@microsoft-cp1252A-      @microsoft-win3.1A :              @microsoft-sym-
bolA   ?  ,       # W    ;

  #          3            ' 3 -       #
                   *##  #        -                                    @mi-
```

```
crosoft-symbolA- @microsoft-cp1252A- @microsoft-win3.1A-    @apple-romanA
        "
```

### Specifying an *ad hoc* encoding file

```
      #  "                #     #
      *  -                @encodings/adobe-dingbats.encA
```

### Specifying font aliases

```
%              " 3 -                "
                                                @adobe-fontspecificA- @mi-
crosoft-win3.1A                        ##    -
"       #       # #

      "                 @fonts.aliasA                 3
# +                   ##                 *
@fonts.aliasA       ,     +


"-ogonki-alamakota-medium-r-normal--0-0-0-0-p-0-iso8859-2" \
  "-ogonki-alamakota-medium-r-normal--0-0-0-0-p-0-adobe-fontspecific"

:"  (.           ;     )                              @fonts.aliasA
#       "                 ,   :;       <,              >   #
```

# Additional notes about scalable core fonts

## About the *FreeType* backend

```
    ! "       " ,  :                  ;    " ,  "     3    /
  #  "  :                 #  "                < #+==     #  =          >;
                REC  ##  # 3   "   *     6 H  :
 *     6 H   "                 < #+==)        H#=        >;      ! "       " ,
  ##                @    A                  :                                ;
 " ,   ##     #      :                    @*.ttfA;- 5#  #      :         @*.otfA;-
  #       :          @*.ttcA;- 5#  #       :          @*.otcA;    #
  :  @*.pfaA     @*.pfbA;

                    #        -       "
" #              "        -     #      -  "
     ? ?  # #     ) # -


:1:mincho.ttc -misc-pmincho-medium-r-normal--0-0-0-0-p-0-jisx0208.1990-0

                    @mincho.ttcA   #

        ! "       " ,   ##     )                  @fonts.dirA   )
"    #      "   #  -    3  ,                                @  #A   * @  #A
              )


option=value:
```

" # " ! " #
## # # # " M *
:@aiA-. " ! , : @dsA; % ") 0 : @bwA; # #
" REC ) # -

```
mincho.ttc -misc-mincho-medium-r-normal--0-0-0-0-c-0-jisx0208.1990-0
ds=y:mincho.ttc -misc-mincho-bold-r-normal--0-0-0-0-c-0-jisx0208.1990-0
ai=0.2:mincho.ttc -misc-mincho-medium-i-normal--0-0-0-0-c-0-jisx0208.1990-0
ds=y:ai=0.2:mincho.ttc -misc-mincho-bold-i-normal--0-0-0-0-c-0-jisx0208.1990-0
bw=0.5:mincho.ttc -misc-mincho-medium-r-normal--0-0-0-0-c-0-jisx0201.1976-0
bw=0.5:ds=y:mincho.ttc -misc-mincho-bold-r-normal--0-0-0-0-c-0-jisx0201.1976-0
bw=0.5:ai=0.2:mincho.ttc -misc-mincho-medium-i-normal--0-0-0-0-c-0-jisx0201.1976-0
bw=0.5:ds=y:ai=0.2:mincho.ttc -misc-mincho-bold-i-normal--0-0-0-0-c-0-jisx0201.197
```

# " H )K/K1 H )K/K
# ) * 6 H #
< #+==) H#= >

! " " , ## D
" # ! " " ,

## Delayed glyph rasterisation

0 # # " # -
! " # #
# : " # ) /; # 3 @3 G A
# # # # 5# #
* %"" - O vl=yO # # "
! "
" B3 # -
" ! " " ,
@3 G A #

) " # # @3 G A #) -
# 0 " ,
@vl=yA # - ## " # # ' 3 -
# " , # " -
" @ * A # =5# # # " -
" # # ##
" # # F 3 ? @3 G A
" - @vl=nA # # " +

```
vl=n:luxirr.ttf -b&h-Luxi Serif-medium-r-normal--0-0-0-0-p-0-iso10646-1
```

5 -" " , ## # :
# 9 - ; * ( . #
# @cA-

```
-misc-mincho-medium-r-normal--0-0-0-0-c-0-jisx0208.1990-0
```

```
fs=c:mincho.ttc -misc-mincho-medium-r-normal--0-0-0-0-p-0-jisx0208.1990-0
```

# Appendix: background and terminology

## Characters and glyphs

## Font files, fonts, and XLFD

-

# 3 G ) 3

# , %
! ( : ( .; * ( . @-A
# " - ) # +

```
-adobe-courier-medium-r-normal--12-120-75-75-m-70-iso8859-1
```

5 # @iso8859-1A #
?

* " # " ( . G +

```
-adobe-courier-medium-r-normal--0-0-0-0-m-0-iso8859-1
```

" # " $ , ( .-
# 3
# - 3
" # @fixedA # " ,
9 " # - @cursorA #
# " " #

! # ( . D @fixedA
@cursorA

```
/usr/share/font/X11/misc/fonts.alias
```

# Unicode

$ : #+== ; 9
# - 0 $
)# # - # "

$ - # "
$ : # - - 3 "
; - $ " -
# " $

$ #
!5W K2M2 * 9 3 -
) '-&*+,+ "

0 - $ 3
( . @iso10646-1A

# References

) 3 #
# % -

:L; < L > , : ; <, > # D
# : ; < 3 : ; < 3
) : ; <) :L; < L ) : ; <)
: ; < > - ( .
# " R

# *U < #+== 9 = 9 =" #= #=
# " -
"

" < #+== >

) # < #+== ,= =H =# =) = > "
# " - " D 3

R 6 G? ) #
< #+== H # G = # =)
@ A -

? # < #+== ## H =VH = = >
"" 3 # 3

% " " 3 " * 6 H #
< #+==) H#= >

0 $ < #+== > " -
, , E ? $ 1 $ *U
< #+== ,=V ,/I= >

B - 3 " " -
# 3 " D ) #
WL L < # +== , = = L L= >