NAME

Xft – X FreeType interface library

DESCRIPTION

Xft is a simple library designed to interface the FreeType rasterizer with the X Rendering Extension. This manual page barely scratches the surface of this library.

HEADER FILE

#include <X11/Xft/Xft.h>

CONSTANTS

XFT_MAJOR
is the major version number of **Xft**.

XFT_MINOR
is the minor version number of **Xft**.

XFT_REVISION
is the revision number of **Xft**.

XFT_VERSION
is **XFT_MAJOR** times 10000 (ten thousand), plus **XFT_MINOR** times 100, plus **XFT_REVISION**.

XftVersion
is an alias for **XFT_VERSION**.

The following example illustrates how **Xft**'s version constants might be used:

```
#if (XFT_VERSION >= 20107)
(void) puts("Version 2.1.7 or later of the Xft library is in"
        " use.");
#else
(void) printf("Insufficient version of Xft (%d.%d.%d) installed;
          " need at least version 2.1.7.\n", XFT_MAJOR,
          XFT_MINOR,
          XFT_REVISION);
#endif
```

DATA TYPES

XftFont

```
typedef struct _XftFont {
   int       ascent;
   int       descent;
   int       height;
   int       max_advance_width;
   FcCharSet   *charset;
   FcPattern   *pattern;
} XftFont;
```

An **XftFont** is the primary data structure of interest to programmers using **Xft**; it contains general font metrics and pointers to the Fontconfig character set and pattern associated with the font. The **FcCharSet** and **FcPattern** data types are defined by the Fontconfig library.

XftFonts are populated with any of **XftFontOpen**(), **XftFontOpenName**(), **XftFontOpenXlfd**(), **XftFontOpenInfo**(), or **XftFontOpenPattern**(). **XftFontCopy**() is used to duplicate **XftFont**s, and **XftFontClose**() is used to mark an **XftFont** as unused. **XftFont**s are internally allocated, reference-counted, and freed by **Xft**; the programmer does not ordinarily need to allocate or free storage for them.

XftDrawGlyphs(), the **XftDrawString***() family, **XftDrawCharSpec**(), and **XftDrawGlyphSpec**() use **XftFont**s to render text to an **XftDraw** object, which may correspond to either a core X drawable or an X Rendering Extension drawable.

XftGlyphExtents() and the **XftTextExtents***() family are used to determine the extents (maximum dimensions) of an **XftFont**.

An **XftFont**'s glyph or character coverage can be determined with **XftFontCheckGlyph**() or **XftCharExists**(). **XftCharIndex**() returns the **XftFont**-specific character index corresponding to a given Unicode codepoint.

XftGlyphRender(), **XftGlyphSpecRender**(), **XftCharSpecRender**(), and the **XftTextRender***() family use **XftFont**s to draw into X Rendering Extension **Picture** structures. **Note: XftDrawGlyphs**(), the **XftDrawString***() family, **XftDrawCharSpec**(), and **XftDrawGlyphSpec**() provide a means of rendering fonts that is independent of the availability of the X Rendering Extension on the X server.

XftFontInfo

is an opaque object that stores information about a font. **XftFontInfo** structures are created with **XftFontInfoCreate**(), freed with **XftFontInfoDestroy**(), and compared with **XftFontInfoEqual**(). **XftFontInfo** objects are internally allocated and freed by **Xft**; the programmer does not ordinarily need to allocate or free storage for them.

Each **XftFontInfo** structure in use is associated with a unique identifier, which can be retrieved with **XftFontInfoHash**(). An **XftFont** can be opened based on **XftFontInfo** data with **XftFontOpenInfo**().

XftColor

```
typedef struct _XftColor {
    unsigned long   pixel;
    XRenderColor    color;
} XftColor;
```

An **XftColor** object permits text and other items to be rendered in a particular color (or the closest approximation offered by the X visual in use). The **XRenderColor** data type is defined by the X Render Extension library.

XftColorAllocName() and **XftColorAllocValue**() request a color allocation from the X server (if necessary) and initialize the members of **XftColor**. **XftColorFree**() instructs the X server to free the color currently allocated for an **XftColor**.

One an **XftColor** has been initialized, **XftDrawSrcPicture**(), **XftDrawGlyphs**(), the **XftDrawString***() family, **XftDrawCharSpec**(), **XftDrawCharFontSpec**(), **XftDrawGlyphSpec**(), **XftDrawGlyphFontSpec**(), and **XftDrawRect**() may be used to draw various objects using it.

XftDraw

is an opaque object which holds information used to render to an X drawable using either the core protocol or the X Rendering extension.

XftDraw objects are created with any of **XftDrawCreate**() (which associates an **XftDraw** with an existing X drawable), **XftDrawCreateBitmap**(), or **XftDrawCreateAlpha**(), and destroyed with **XftDrawDestroy**(). The X drawable associated with an **XftDraw** can be changed with **XftDrawChange**(). **XftDraw**s are internally allocated and freed by **Xft**; the programmer does not ordinarily need to allocate or free storage for them.

The X **Display**, **Drawable**, **Colormap**, and **Visual** of an **XftDraw** can be queried with **XftDrawDisplay**(), **XftDrawDrawable**(), **XftDrawColormap**(), and **XftDrawVisual**(), respectively. The X Rendering Extension **Picture** associated with an **XftDraw** is returned by **XftDrawPicture**().

XftCharSpec

```
typedef struct _XftCharSpec {
    FcChar32    ucs4;
    short       x;
    short       y;
} XftCharSpec;
```

The **FcChar32** data type is defined by the Fontconfig library.

XftCharFontSpec

```
typedef struct _XftCharFontSpec {
   XftFont     *font;
   FcChar32    ucs4;
   short       x;
   short       y;
} XftCharFontSpec;
```

The **FcChar32** data type is defined by the Fontconfig library.

XftGlyphSpec

```
typedef struct _XftGlyphSpec {
   FT_UInt     glyph;
   short       x;
   short       y;
} XftGlyphSpec;
```

The **FT_UInt** data type is defined by the FreeType library.

XftGlyphFontSpec

```
typedef struct _XftGlyphFontSpec {
   XftFont     *font;
   FT_UInt     glyph;
   short       x;
   short       y;
} XftGlyphFontSpec;
```

The **FT_UInt** data type is defined by the FreeType library.

FUNCTIONS

Opening and Matching Fonts

XftFont *
XftFontOpen (Display ***dpy*,**
int *screen***,**
...);

XftFontOpen takes a list of pattern element triples of the form *field*, *type*, *value* (terminated with a NULL), matches that pattern against the available fonts, and opens the matching font, sizing it correctly for screen number *screen* on display *dpy*. The **Display** data type is defined by the X11 library. Returns NULL if no match is found.

Example:

```
font = XftFontOpen (dpy, screen,
                    XFT_FAMILY, XftTypeString, "charter",
                    XFT_SIZE, XftTypeDouble, 12.0,
                    NULL);
```

This opens the “charter” font at 12 points. The point size is automatically converted to the correct pixel size based on the resolution of the monitor.

XftFont *
XftFontOpenName (Display *****dpy*,**
int *screen***,**
unsigned char ***name*);**

XftFontOpenName behaves as **XftFontOpen** does, except that it takes a Fontconfig pattern string (which is passed to the Fontconfig library’s **FcNameParse**() function).

XftFont *
XftFontOpenXlfd (Display *****dpy*,**
int *screen***,**

unsigned char *_xlfd_)

XftFontOpenXlfd behaves as **XftFontOpen** does, except that it takes a string containing an X Logical Font Description (XLFD).

FcPattern *
XftFontMatch (Display *_dpy_,
int _screen_,
FcPattern *_pattern_,
FcResult *_result_);

Also used internally by the **XftFontOpen*** functions, **XftFontMatch** can also be used directly to determine the Fontconfig font pattern resulting from an Xft font open request. The **FcPattern** and **FcResult** data types are defined by the Fontconfig library.

Determining the Pixel Extents of a Text String

void
XftTextExtents8 (Display *_dpy_,
XftFont *_font_,
FcChar8 *_string_,
int _len_,
XGlyphInfo *_extents_);

XftTextExtents8 computes the pixel extents on display *dpy* of no more than *len* glyphs of a *string* consisting of eight-bit characters when drawn with *font*, storing them in *extents*. The **FcChar8** data type is defined by the Fontconfig library, and the **XGlyphInfo** data type is defined by the X Rendering Extension library.

void
XftTextExtents16 (Display *_dpy_,
XftFont *_font_,
FcChar16 *_string_,
int _len_,
XGlyphInfo *_extents_);

XftTextExtents16 computes the pixel extents on display *dpy* of no more than *len* glyphs of a *string* consisting of sixteen-bit characters when drawn with *font*, storing them in *extents*. The **FcChar16** data type is defined by the Fontconfig library, and the **XGlyphInfo** data type is defined by the X Rendering Extension library.

void
XftTextExtents32 (Display *_dpy_,
XftFont *_font_,
FcChar32 *_string_,
int _len_,
XGlyphInfo *_extents_);

XftTextExtents32 computes the pixel extents on display *dpy* of no more than *len* glyphs of a *string* consisting of thirty-two-bit characters when drawn with *font*, storing them in *extents*. The **FcChar32** data type is defined by the Fontconfig library, and the **XGlyphInfo** data type is defined by the X Rendering Extension library.

void
XftTextExtentsUtf8 (Display *_dpy_,
XftFont *_font_,
FcChar8 *_string_,
int _len_,
XGlyphInfo *_extents_);

XftTextExtentsUtf8 computes the pixel extents on display *dpy* of no more than *len* bytes of a UTF-8 encoded *string* when drawn with *font*, storing them in *extents*. The **XGlyphInfo** data type is defined by the X Rendering Extension library.

void

XftTextExtentsUtf16 (Display *dpy,
XftFont *font,
FcChar8 *string,
FcEndian endian,
int len,
XGlyphInfo *extents);

XftTextExtentsUtf16 computes the pixel extents on display *dpy* of no more than *len* bytes of a UTF-16LE- or UTF-16BE-encoded *string* when drawn with *font*, storing them in *extents*. The endianness of *string* must be specified in *endian*. The **FcEndian** data type is defined by the Fontconfig library, and the **XGlyphInfo** data type is defined by the X Rendering Extension library.

void
XftGlyphExtents (Display *dpy,
XftFont *font,
FT_UInt *glyphs,
int nglyphs,
XGlyphInfo *extents);

Also used internally by the **XftTextExtents*** functions, **XftGlyphExtents** computes the pixel extents on display *dpy* of no more than *nglyphs* in the array *glyphs* drawn with *font*, storing them in *extents*. The **FT_UInt** data type is defined by the FreeType library, and the **XGlyphInfo** data type is defined by the X Rendering Extension library.

Drawing Strings (and Other Things)

XftDraw *
XftDrawCreate (Display *dpy,
Drawable drawable,
Visual *visual,
Colormap colormap);

XftDrawCreate creates a structure that can be used to render text and rectangles using the specified *drawable*, *visual*, and *colormap* on *display*. The **Drawable**, **Visual**, and **Colormap** data types are defined by the X11 library.

XftDraw *
XftDrawCreateBitmap (Display *dpy,
Pixmap bitmap);

XftDrawCreateBitmap behaves as **XftDrawCreate**, except it uses an X pixmap of color depth 1 instead of an X drawable. The **Pixmap** data type is defined by the X11 library.

XftDraw *
XftDrawCreateAlpha (Display *dpy,
Pixmap pixmap,
int depth);

XftDrawCreateAlpha behaves as **XftDrawCreate**, except it uses an X pixmap of color depth *depth* instead of an X drawable. The **Pixmap** data type is defined by the X11 library.

void
XftDrawChange (XftDraw *draw,
Drawable drawable);

XftDrawChange changes the X drawable association of the existing Xft draw object *draw* from its current value to *drawable*.

Display *
XftDrawDisplay (XftDraw *draw);

XftDrawDisplay returns a pointer to the display associated with the Xft draw object *draw*.

Drawable
XftDrawDrawable (XftDraw *draw);

XftDrawDrawable returns the X drawable associated with the Xft draw object *draw*.

Colormap
XftDrawColormap (XftDraw *_draw_);
XftDrawColormap returns the colormap associatied with the Xft draw object *draw*.

Visual *
XftDrawVisual (XftDraw *_draw_);
XftDrawVisual returns a pointer to the visual associated with the Xft draw object *draw*.

Picture
XftDrawPicture (XftDraw *_draw_);
XftDrawPicture returns the picture associated with the Xft draw object *draw*. If the the X server does not support the X Rendering Extension, 0 is returned.

Picture
XftDrawSrcPicture (XftDraw *_draw_,
XftColor *_color_);
This function is never called if the X server doesn't support the X Rendering Extension; instead, **XftGlyphCore** is used.

void
XftDrawDestroy (XftDraw *_draw_);
XftDrawDestroy destroys *draw* (created by one of the **XftCreate** functions) and frees the memory that was allocated for it.

void
XftDrawString8 (XftDraw *_d_,
XftColor *_color_,
XftFont *_font_,
int *x*,
int *y*,
unsigned char *_string_,
int *len*);
XftDrawString8 draws no more than *len* glyphs of *string* to Xft drawable *d* using *font* in *color* at position *x*, *y*.

void
XftDrawRect (XftDraw *_d_,
XftColor *_color_,
int *x*,
int *y*,
unsigned int *width*,
unsigned int *height*);
XftDrawRect draws a solid rectangle of the specified *color*, *width*, and *height* at position *x*, *y* to Xft drawable *d*.

COMPATIBILITY

As of version 2, **Xft** has become relatively stable and is expected to retain source and binary compatibility in future releases.

Xft does provide a compatibility interface to its previous major version, Xft 1.*x*, described below.

Xft 1.x Compatibility Header File

#include <X11/Xft/XftCompat.h>

Xft 1.x Compatibility Data Types

XftPattern
holds a set of names with associated value lists; each name refers to a property of a font. **XftPattern**s are used as inputs to the matching code as well as holding information about specific fonts.

XftFontSet
contains a list of **XftPattern**s. Internally, **Xft** uses this data structure to hold sets of fonts. Externally, **Xft** returns the results of listing fonts in this format.

XftObjectSet
holds a set of names and is used to specify which fields from fonts are placed in the the list of returned patterns when listing fonts.

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SEE ALSO

Fontconfig Developers Reference
FreeType API Reference
Xlib − C Language Interface