Chapter 6

Scalar X11 Man Pages

CM Fortran programmers cannot call X11 routines directly, as C* programmers can. Therefore, CMX11 includes several wrappers for scalar X11 routines. They are:

XBlackPixel
XDefaultScreen
XDrawArc
XDrawImageString
XDrawLine
XDrawPoint
XDrawRectangle
XDrawString
XFillArc
XFillRectangle
XFlush
XLoadFont
XSetFont
XSetWindowBackground
XSync
XWhitePixel

These wrappers are available only from CM Fortran. C* users can call the corresponding X routines directly.

Below is a sample wrapper. You can use this as a template if you want to write more wrappers for your convenience. It is a C file, and should be compiled with **cc** or **gcc** and linked into the application.

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```
/* ======================================================== */
/* XDrawPoint interface for CMF, as implemented in CMX11. */

#include <cm/cmx.h>
#include <cm/cmxdisplay.h>

/* Function name in all lowercase, with trailing underscore.
 * All parameters passed in as pointers and dereferenced.
 * Note 'display' is passed in as Display **, dereferencing
 * it once gives a Display *, which is correct for Xlib
 * functions.
 */
void xdrawpoint_(Display **display, Drawable *d, GC *gc,
                 int *x, int *y)
{
  XDrawPoint(*display, *d, *gc, *x, *y);
}

/* ======================================================== */
```

UNIX-style man pages for the wrappers follow.

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XBlackPixel

Returns the black pixel value in the default colormap.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

INTEGER FUNCTION XBlackPixel(display, screen_number)
   INTEGER display
   INTEGER screen_number
```

ARGUMENTS

display	An integer identifying the X11 display.
screen_number	An integer specifying the appropriate screen number on the host server (returned by **XDefaultScreen).**

DESCRIPTION

XBlackPixel returns the black pixel value in the screen's default colormap.

NOTE: C* users can use the macro **BlackPixel** instead, for speed.

SEE ALSO

XWhitePixel
XDefaultScreen

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XDefaultScreen

Obtains the default screen number.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

INTEGER FUNCTION XDefaultScreen(display)
   INTEGER display
```

ARGUMENT

display	An integer identifying the X11 display.

DESCRIPTION

XDefaultScreen returns the integer that specifies the default screen number of the specified display.

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XDrawArc, XFillArc

Draws/fills a single arc.

CM FORTRAN SYNTAX

```
 INCLUDE '/usr/include/cm/cmx-cmf.h'

 SUBROUTINE XDrawArc(display, drawable, gc, x, y, width, height, angle1,
&                    angle2)

 SUBROUTINE XFillArc(display, drawable, gc, x, y, width, height, angle1,
&                    angle2)

    INTEGER display
    INTEGER drawable
    INTEGER gc
    INTEGER x, y
    INTEGER width, height
    INTEGER angle1, angle2
```

ARGUMENTS

display	An integer identifying the X11 display to which you wish to draw.
drawable	An integer identifying the window on *display* or pixmap in which you wish to draw.
gc	An integer identifying the X11 graphics context to be applied to drawing the arc.
x, y	The coordinates of the upper left corner of the arc's bounding rectangle.
width, height	The dimensions, in pixels, of the arc's bounding rectangle. *width* is the distance, in pixels, to the right from the point (*x*, *y*). *height* is the distance, in pixels, downward.

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angle1 The starting point of the arc, relative to the 3:00 position from the center of the bounding rectangle. The position is given in sixty-fourths of a degree. Positive values move counterclockwise; negative values move clockwise.

angle2 The ending position of the arc, relative to *angle1*.

DESCRIPTION

XDrawArc draws and **XFillArc** fills a circular or elliptical arc, in the foreground color set in the display's graphics context.

The arguments *x*, *y*, *width*, and *height* define the bounding box of the arc, that is, the rectangle that contains the arc. The upper left corner of the rectangle is defined by (*x*, y), and the rectangle extends to the right *width* pixels and downward *height* pixels. The center of the arc is at the center of this rectangle, and the curve of the arc is drawn to intersect with the sides of the rectangle.

The length of the arc is defined by *angle1* and *angle2*. *angle1* specifies the start of the arc relative to the 3:00 position from the center of the bounding rectangle. *angle2* specifies the end of the arc relative to *angle1*. The angles are given in sixty-fourths of a degree. Positive values move counterclockwise. 360 * 64 is a complete circle.

CMXFillArc fills the area enclosed by the arc. The exact area is determined by the **arc_mode** set in the graphics context. If the **arc_mode** in the graphics context *gc* is **ArcChord** (the default), the arc is filled to a line joining the endpoints of the arc. If **arc_mode** is **ArcPieSlice**, the boundary of the arc is defined by line segments from the endpoints of the arc to its center point. The **arc_mode** is set with the X Window System routine **XSetArcMode**. (Note that there is no CM Fortran binding for **XSetArcMode**; you must write a C wrapper for it.)

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XDrawLine

Draws a single line.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XDrawLine(display, drawable, gc, x1, y1, x2, y2)
   INTEGER display
   INTEGER drawable
   INTEGER gc
   INTEGER x1, y1
   INTEGER x2, y2
```

ARGUMENTS

display	An integer identifying the X11 display to which you wish to draw.
drawable	An integer identifying the window on *display* or pixmap in which you wish to draw.
gc	An integer identifying the X11 graphics context to be applied to drawing the line.
x1, *y1*	The start coordinates of the line to be drawn.
x2, *y2*	The end coordinates of the line to be drawn.

DESCRIPTION

XDrawLine draws a line between the points (*x1*, *y1*) and (*x2*, *y2*), in the foreground color. No pixel is drawn more than once.

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XDrawPoint

Draws a single point.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XDrawPoint(display, drawable, gc, x, y)
   INTEGER display
   INTEGER drawable
   INTEGER gc
   INTEGER x, y
```

ARGUMENTS

display	An integer identifying the X11 display to which you wish to draw.
drawable	An integer identifying the window on *display* or pixmap in which you wish to draw.
gc	An integer identifying the X11 graphics context to be applied to drawing the point.
x, *y*	The coordinates of the point to be drawn.

DESCRIPTION

XDrawPoint draws the point (*x*, *y*) in the specified drawable, using the foreground color defined in the drawable's graphics context.

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XDrawRectangle, XFillRectangle

Draws/fills a rectangle.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XDrawRectangle(display, drawable, gc, x, y, width, height)

SUBROUTINE XFillRectangle(display, drawable, gc, x, y, width, height)

   INTEGER display
   INTEGER drawable
   INTEGER gc
   INTEGER x, y
   INTEGER width, height
```

ARGUMENTS

display	An integer identifying the X11 display to which you wish to draw.
drawable	An integer identifying the window on *display* or pixmap in which you wish to draw.
gc	An integer identifying the X11 graphics context to be applied to drawing the rectangle.
x, *y*	The coordinates of the upper left corner of the rectangle.
width, *height*	The dimensions, in pixels, of the rectangle.

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DESCRIPTION

XDrawRectangle draws the outline of the specified rectangle, and **XFillRectangle** fills the specified rectangle. The coordinates (*x*, *y*) define the upper left corner of the rectangle to be drawn in relation to the origin of the window. *width* and *height* specify the size of the rectangle from the point (*x*, *y*). *width* is the number of pixels the rectangle extends to the right, and *height* is the number of pixels it extends downward.

XDrawRectangle draws the outline of the rectangle in the foreground color defined in the drawable's graphics context. **XFillRectangle** draws a filled rectangle. Note that **XFillRectangle** does not light pixels along the right and bottom edges of the area lit by **XDrawRectangle**. A drawn rectangle outlines a rectangle from (*x*, *y*) at the upper left corner to ($x + width$, $y + height$) at the lower right corner. A filled rectangle creates a solid rectangle from (*x*, *y*) to ($x + (width - 1)$, $y + (height - 1)$).

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XDrawString, XDrawImageString

Draws a text string.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XDrawString(display, drawable, gc, x, y, string, length)

SUBROUTINE XDrawImageString(display, drawable, gc, x, y, string, length)

   INTEGER display
   INTEGER drawable
   INTEGER gc
   INTEGER x, y
   CHARACTER *(*) string
   INTEGER length
```

ARGUMENTS

display	An integer identifying the X11 display to which you wish to draw.
drawable	An integer identifying the window on *display* or pixmap in which you wish to draw.
gc	An integer identifying the X11 graphics context to be applied to drawing the string.
x, *y*	The coordinates at which the text string is to be drawn.
string	The character string to be drawn.
length	The length of the string, in characters.

DESCRIPTION

XDrawString writes a string to the specified drawable in the foreground color.

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XDrawImageString first fills a destination rectangle with the background color defined in the GC and then draws the text with the foreground color. The upper left corner of the filled rectangle is at (x, y − **font_ascent**), the width is **overall.width**, and the height is **ascent** + **descent**.

The coordinates (x, y) define the origin of the text string; y is the baseline row of pixels, and x is the point from which the text string's lbearing, rbearing, and width are measured.

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XFlush

Flushes the output buffer.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XFlush(display)
   INTEGER display
```

ARGUMENT

display	An integer identifying the X11 display.

DESCRIPTION

XFlush flushes the output buffer, sending to the display all output requests that have been buffered but not yet sent. Since X is buffered, drawing requests are not visible until they are flushed, or until an event is waited for. **XFlush** allows you to see what you have drawn.

SEE ALSO

XSync

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XLoadFont

Loads the specified font.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

INTEGER FUNCTION XLoadFont(display, name)
   INTEGER display
   CHARACTER *(*) name
```

ARGUMENTS

display	An integer identifying the X11 display.
name	A string specifying the name of the font.

DESCRIPTION

XLoadFont loads the font specified by *name* into the server if it has not already been loaded. If the operation is successful, **XLoadFont** returns the font's associated font ID; otherwise, it returns 0.

A font name is of the form:

−foundry−family−weight−slant−set width−additional style−pixel size−point size−res.x−res.y−spacing−average width−registry−encoding

For instance, to load 24-point Helvetica Bold, *name* could be:

```
-*-helvetica-bold-r-*-*-*-240-*
```

where "*" matches anything, "r" means "roman," and "240" is the point size, in decipoints.

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SEE ALSO

XSetFont
XDrawString
XDrawImageString

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XSetFont

Sets the current font in the specified GC.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XSetFont(display, gc, font)
   INTEGER display
   INTEGER gc
   INTEGER font
```

ARGUMENTS

display	An integer identifying the X11 display.
gc	An integer identifying the X11 graphics context in which to set the font.
font	An integer identifying the font to be set.

DESCRIPTION

XSetFont sets the font in the graphics context. This font will be used by text-drawing routines that use this GC.

SEE ALSO

XLoadFont
XDrawString
XDrawImageString

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XSetWindowBackground

Sets the color to be used for a window's background.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XSetWindowBackground(display, w, background_pixel)
   INTEGER display
   INTEGER w
   INTEGER background_pixel
```

ARGUMENTS

display	An integer identifying the X11 display.
w	An integer identifying the window ID.
background_pixel	An integer specifying which entry in the colormap is to be used as the background color.

DESCRIPTION

XSetWindowBackground sets the color to be used to fill a window's background when the window is cleared. The current contents of the window are not changed.

NOTE: Calling **XSetWindowBackground** has no immediate effect; you must call **CMXClearDisplay** to clear the window to that color. This background color is distinct from what is set by **CMXSetBackground**. **CMXSetBackground** sets the background element in the graphics context used by functions that draw in a background color, such as **CMXPutImage1** and **XDrawImageString**.

SEE ALSO

CMXClearDisplay

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XSync

Synchronizes the display with the client.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

SUBROUTINE XSync(display, discard)
   INTEGER display
   INTEGER discard
```

ARGUMENTS

display	An integer identifying the X11 display.
discard	An integer specifying whether to discard all events on the input queue.

DESCRIPTION

XSync synchronizes the display with the client application. **XSync** calls **XFlush**, and then waits for any return values or errors to come back from the server. If *discard* is true (nonzero), any pending events are discarded; otherwise, they are retained in the X event queue. **XSync** is more useful than **XFlush** for debugging because it allows you to see any errors that may have been generated by earlier X function calls.

SEE ALSO

XFlush

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XWhitePixel

Returns the white pixel value in the default colormap.

CM FORTRAN SYNTAX

```
INCLUDE '/usr/include/cm/cmx-cmf.h'

INTEGER FUNCTION XWhitePixel(display, screen_number)
   INTEGER display
   INTEGER screen_number
```

ARGUMENTS

display	An integer identifying the X11 display.
screen_number	An integer specifying the appropriate screen number on the host server (returned by **XDefaultScreen**).

DESCRIPTION

XWhitePixel returns the white pixel value in the screen's default colormap.

NOTE: C* users can use the macro **WhitePixel** instead, for speed.

SEE ALSO

XBlackPixel
XDefaultScreen

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