

`$SPAD/src/lib pixmap.c`

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**Abstract**

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## 1 MAC OSX zopen redefinition

On the [[MAC OSX]] platform they defined [[zopen]]. Since the function is only used in this file we simply rename it to [[zzopen]].

— mac zopen redefinition 1 —

```
FILE *  
zzopen(char *file,char * mode)
```

—————

— mac zopen redefinition 2 —

```
file = zzopen(filename, "r");
```

—————

## 2 License

```
/*  
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```

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```

```

*/

      — * —

#include <X11/Xlib.h>
#include <X11/Xutil.h>
#include <X11/Xos.h>
#include <stdlib.h>
#include <stdio.h>
#include <netinet/in.h>

#define yes 1
#define no 0

#include "spadcolors.h"

#include "pixmap.h1"
#include "hallo.h1"
#include "spadcolors.h1"

/* returns true if the file exists */

int
file_exists(char *file)
{
    FILE *f;

    if ((f = fopen(file, "r")) != NULL) {
        fclose(f);
        return 1;
    }
    return 0;
}

\getchunk{mac zopen redefinition 1}
{
    char com[512], zfile[512];

    if (file_exists(file))
        return fopen(file, mode);
    sprintf(zfile, "%s.Z", file);
    if (file_exists(zfile)) {
        sprintf(com, "gunzip -c %s.Z 2>/dev/null", file);
        return popen(com, mode);
    }
}

```

```

    }
    return NULL;
}
#endif OLD

/*****
KF 6/14/90
write_pixmap_file(display, filename, pm, width, height)
    and
write_pixmap_file_xy(display, filename, pm, x, y, width, height)
has been merged into one function.

INPUT: display dsp, screen s, file name fn to write the file in,
       window id wid where pixmap is,
       upper left corner x, y of original pixmap,
       width and height of pixmap
OUTPUT: binary file with data
PURPOSE: write_pixmap_file gets the image structure of the input
         pixmap, convert the image data with the permutation color
         vector, writes the image structure out to filename.

Note that writing out a Z pixmap is 8x faster than XY pixmap.
This is because XY writes out each pixel value per plane, thus
number of bits; Z writes out each pixel, or 8 bits at a time.

The XY format may have been chosen for a reason -- I don't know.

*****/
void
write_pixmap_file(Display *dsp, int scr, char *fn,
                  Window wid, int x, int y, int width, int height)
{
    XImage *xi;
    FILE *file;
    int *permVector;
    int num;
    int num_colors;

    /* get color map and permutation vector */
    if ((num_colors = makePermVector(dsp, scr, (unsigned long **)&permVector)) < 0) {
        printf("num_colors < 0!!\n");
        exit(-1);
    }

    /* reads image structure in ZPixmap format */
    xi = XGetImage(dsp, wid, x, y, width, height, AllPlanes, ZPixmap);
    file = fopen(fn, "wb");
    if (file == NULL) {
        perror("opening pixmap file for write");
        exit(-1);
    }

```

```

    }

#define PUTW(a,b) putw(htonl(a),b)

    PUTW(xi->width, file);
    PUTW(xi->height, file);
    PUTW(xi->xoffset, file);
    PUTW(xi->format, file);
    PUTW(xi->byte_order, file);
    PUTW(xi->bitmap_unit, file);
    PUTW(xi->bitmap_bit_order, file);
    PUTW(xi->bitmap_pad, file);
    PUTW(xi->depth, file);
    PUTW(xi->bytes_per_line, file);
    PUTW(xi->bits_per_pixel, file);
    PUTW(xi->red_mask, file);
    PUTW(xi->green_mask, file);
    PUTW(xi->blue_mask, file);

    num = xi->bytes_per_line * height; /* total number of pixels in pixmap */

    /* store value from permutation */
    {
        int ii, jj;

        for (ii = 0; ii < width; ii++)
            for (jj = 0; jj < height; jj++) {
                XPutPixel(xi, ii, jj, permVector[(int) XGetPixel(xi, ii, jj)]);
            }
    }
    fwrite(xi->data, 1, num, file);
    fclose(file);
}

```

```

/*****
KF 6/14/90

```

```

INPUT: display, screen, filename to read the pixmap data from,
OUTPUT: ximage structure xi, width and height of pixmap
PURPOSE: read_pixmap_file reads an Ximage data structure from
the input file.
This routine can handle pixmaps of both XYPixmap and
ZPixmap. If a pixmap has ZPixmap format, then the image
data, read in as spadColor index, is converted to the
pixel value using spadColor.

```

Note that reading in Z format takes less space and time too.

```

*****/

```

```

int
read_pixmap_file(Display *display, int screen, char *filename,
                 XImage **xi, int *width, int *height)
{
    FILE *file;
    int wi, h, num, num_colors, read_this_time, offset;
    Colormap cmap;
    int ts;
    unsigned long *spadColors;

    /* colormap is necessary to call makeColors */
    cmap = DefaultColormap(display, screen);
    if ((num_colors = makeColors(display, screen, &cmap, &spadColors, &ts)) < 0) {
        return(-1);
    }
\getchunk{mac zopen redefinition 2}
    if (file == NULL) {
        printf("couldn't open %s\n", filename);
        return BitmapOpenFailed;
    }
#define GETW(f) ntohl(getw(f))
    *width = wi = GETW(file);
    *height = h = GETW(file);
    (*xi) = XCreateImage(display, DefaultVisual(display, screen),
                        DisplayPlanes(display, screen),
                        ZPixmap, 0, NULL, wi, h, 16, 0); /* handles both XY & Z */
    if ((*xi) == NULL) {
        fprintf(stderr, "Unable to create image\n");
        return(-1);
    }
    (*xi)->width = wi;
    (*xi)->height = h;
    (*xi)->xoffset = GETW(file);
    (*xi)->format = GETW(file);
    (*xi)->byte_order = GETW(file);
    (*xi)->bitmap_unit = GETW(file);
    (*xi)->bitmap_bit_order = GETW(file);
    (*xi)->bitmap_pad = GETW(file);
    (*xi)->depth = GETW(file);
    (*xi)->bytes_per_line = GETW(file);
    (*xi)->bits_per_pixel = GETW(file);
    (*xi)->red_mask = GETW(file);
    (*xi)->green_mask = GETW(file);
    (*xi)->blue_mask = GETW(file);

    /* program will bomb if XYPixmap is not allocated enough space */
    if ((*xi)->format == XYPixmap) {
        /* printf("picture is in XYPixmap format.\n"); */
        num = (*xi)->bytes_per_line * h * (*xi)->depth;
    }
}

```

```

else
    /* ZPixmap */
    num = (*xi)->bytes_per_line * h;
    (*xi)->data = (void*)malloc(num, "Ximage data");

    offset = 0;
    while (offset < num) {
        read_this_time = fread((*xi)->data + offset, 1, num - offset, file);
        offset = offset + read_this_time;
    }
    fclose(file);

    /*
     * pixmap data in ZPixmap format are spadColor indices; pixmap data in
     * XYPixmap format are pixel values
     */
    if ((*xi)->format == ZPixmap) {

        int ii, jj;

        for (ii = 0; ii < wi; ii++)
            for (jj = 0; jj < h; jj++) {
                XPutPixel(*xi, ii, jj, spadColors[(int) XGetPixel(*xi, ii, jj)]);
            }

    }

    return 0;
}

#else /*OLD*/

#include "xpm.h"

int
read_pixmap_file(Display *display, int screen, char *filename,
                 XImage **xi, int *width, int *height)
{
    XpmAttributes attr;
    XImage *xireturn;

    attr.valuemask = 0;

    attr.bitmap_format=ZPixmap;          /* instead of XYPixmap */
    attr.valuemask |= XpmBitmapFormat;
    attr.valuemask |= XpmSize;          /* we want feedback on width,height */
    attr.valuemask |= XpmCharsPerPixel; /* and cpp */
    attr.valuemask |= XpmReturnPixels;  /* and pixels, npixels */

```

```

attr.valuemask |= XpmReturnAllocPixels; /* and alloc_pixels, nalloc_pixels */
attr.exactColors = False;
attr.valuemask |= XpmExactColors;      /* we don't want exact colors*/
attr.closeness = 30000;
attr.valuemask |= XpmCloseness;        /* we specify closeness*/
attr.alloc_close_colors = False;
attr.valuemask |= XpmAllocCloseColors; /* we don't allocate close colors*/

XpmReadFileToImage(display,filename,xi,&xireturn, &attr );
*width= (*xi)->width;
*height=(*xi)->height;
#ifdef DEBUG
fprintf(stderr,"image file:%s\n",filename);
fprintf(stderr,"\twidth:%d\theight:%d\tcpp:%d\n",attr.width,attr.height,attr.cpp);
fprintf(stderr,"\tused/alloc'ed color pixels:%d/%d\n",attr.npixels,attr.nalloc_pixels);
#endif
return 0;
}

void
write_pixmap_file(Display *dsp, int scr, char *fn,
                  Window wid, int x, int y, int width,int height)
{
    XImage *xi;

    /* reads image structure in ZPixmap format */
    xi = XGetImage(dsp, wid, x, y, width, height, AllPlanes, ZPixmap);
    if (xi==0) return ;
    XpmWriteFileFromImage(dsp,fn,xi,0,0);
}

#endif

```

## References

[1] nothing