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Handling Graphics with VFP8, GDI+ and Web Connection

by

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Introduction

By day, Kevin Cully is a mild mannered programmer / analyst at Coalition America Inc. in Atlanta, GA; but by night Kevin is the President of the sole proprietorship CULLY Technologies, LLC. that designs websites, creates database applications and makes presentations for the Atlanta Foxpro Users Group!

Cully Technologies, LLC has been in existence since 2000, and since that time, he has concentrated on building web sites, web applications, and fat client applications in a variety of commercial industries.

Kevin has been programming in FoxPro since FoxPro 2.0 for DOS in 1992 and has been programming using the Web Connection framework since 1997.

He utilizes Visual Interdev, Photoshop, Flash, ASP, VBScript, JavaScript, Access, Visual FoxPro, SQL Server, and Web Connection.

This document is an expansion of the outline used in the April 17th, 2003 presentation.

Assumptions

This presentation assumes that you have a full understanding of VFP and object oriented programming. It is also assumed that you have a foundational understanding of HTML, graphic file formats, and a cursory knowledge of Web Connection.

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INTRODUCTION

VFP 8 has replaced the manner in which graphics are utilized. All graphics are now handled through the GDI+ graphics engine, a C/C++ API that handles graphics on the applications behalf. The GDI+ engine is much more versatile, providing extended functionality that wasn't available to VFP developers. Our applications can handle graphics in a more flexible way utilizing more formats.

The controls that can utilize the GDI+ graphics in various capacities are: Check Box, Command Button, Combo Box, Container, Control, Custom, Form Object, Image Control, List Box, Option Button, Page Object, and _SCREEN.

Supported graphic formats: Animated Cursor (.ani), Bitmap (.bmp), Cursor (.cur), Device Independent Bitmap (.dib), Windows Enhanced Metafile (.emf), Exchangeable Image File (.exif), Graphics Interchange Format (.gif, .gfa), Icon (.ico), Joint Photographic Electronic Group (.jpg, .jpeg, .jpe, .jfif), Portable Networks Graphics (.png), Tag Image File Format (.tif, .tiff), Windows Metafile (.wmf)

With all of these great new features in VFP8, we still don't have any tools to manipulate graphics and images externally. West-Wind Web Connection, beginning with version 4.20 began exposing certain GDI+ functions via the wwImaging.dll and some extended functions.

We will be taking these functions to the limit, discussing the capabilities, strengths and weaknesses by way of example. I've created a sample application called CTImage.
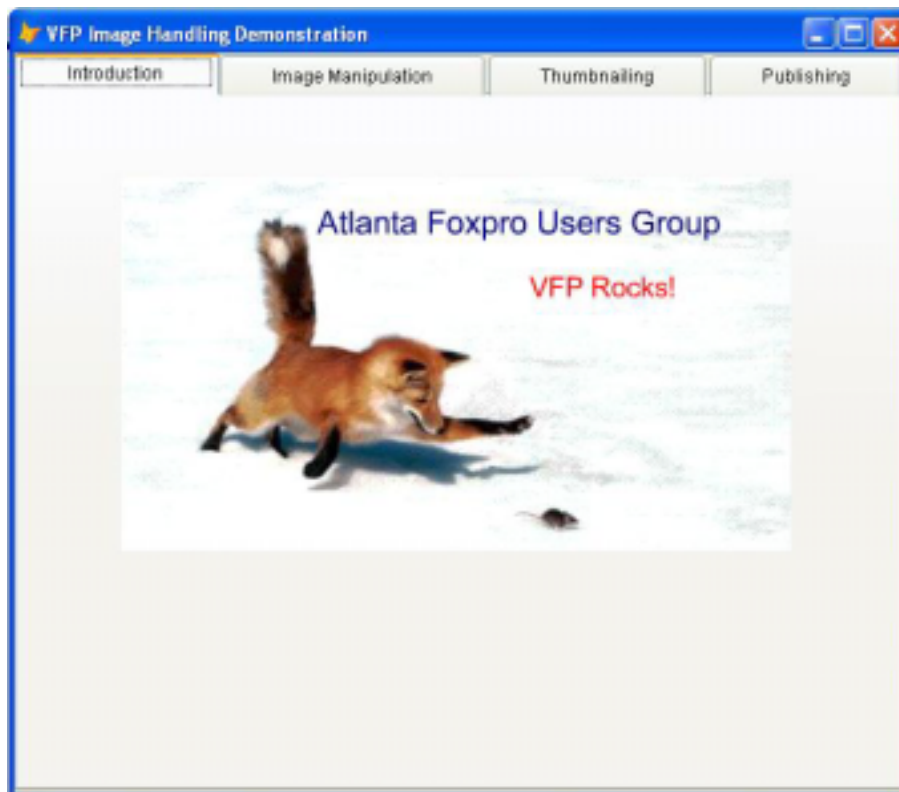
CTIMAGE

Read this next section of specifications and see if this sounds like a VFP application to you.

Create a Windows application that will do the following:
- can load a variety of graphical formats
- provide information about the image such as height, width, and DPI
- can flip the image horizontally and vertically
- rotate the image left and right
- crop the image with a highlighting operation
- convert that image from its native format to any of a number of others
- show the image history
- provide an unlimited rollback ability, reverting the image to any point in its history
- thumbnail the image into web and thumbnail sizes
- during the thumbnail process, convert certain file types to more web friendly formats
- generate an ASP page containing the thumbnailed images
- FTP the thumbnailed images and corresponding ASP page to a web server

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NEW IMAGE HANDLING TOOLS

The Web Connect product has exposed many image handling functions to us. As with anything, there is the good, the ugly, and the bad. (The order is intentional.)

THE GOOD FUNCTIONS
- ResizeImage(lcSource,lcTarget,lnWidth,lnHeight,lnCompression) :: Creates a Thumbnail image from a source file into another file.
- CopyImage(lcSource,lcTarget) :: Copies an image from one format to another. Many formats are supported.
- CreateThumbNail(lcSource,lcTarget,lnWidth,lnHeight) :: Creates a Thumbnail image from a file into another file.
- GetImageInfo(lcImage,lnWidth,lnHeight,lnResolution) :: Returns Width, Height and Resolution of an image. Pass the last 3 parameters in by Reference.
- RotateImage(lcImage,lnFlipType) :: Rotates and/or flips an image. Notice that the original image is changed in this function.
- ReadImage(lcSource, lcTarget, lnLeft, lnTop, lnWidth, lnHeight) :: Reads a portion of an existing source image and writes it into a new target image.

THE UGLY FUNCTIONS
- ResizeImage(lcSource,lcTarget,lnWidth,lnHeight,lnCompression) :: Creates a Thumbnail image from a file into another file. This function was up in the "good" functions but it also qualifies here in the "ugly" functions as well. ResizeImage does not allow for an image to be increased in size. Granted that the image will lose resolution, I was hoping to take advantage of this feature to do some simple editing. This relied upon WriteImage as well which doesn't work either.
- WriteImage(lcSource, lcInsert, lnLeft, lnTop) :: Supposedly takes the source image and inserts the Insert image into it starting at the top, left coordinates. What occurs is that an image 672 x 16 pixels is written over the source image. I've tried varying formats and varying sizes of images, all with the same results. I've put in a bug report to West-Wind and hopefully they will have this resolved in the next minor release. I was going to create a "branding" or "watermark" type functionality utilizing this function.

THE BAD FUNCTIONS
These are the bad functions because they don't exist. Perhaps this is more of a wish list. I guess I could plunk down the bucks for a real image editing toolkit like LeadTools but I'm going to put this down on the wish list anyway.
- Color Balancing
- Contrast
- Special Effects
- Red-Eye Reduction

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IMAGE MANIPULATION

This page of the pageframe contains the functionality to do simple manipulations of the image; saving, saving as another format, flipping horizontally, flipping vertically, rotating left and right, and cropping. Also available for display are the image attributes, and the history of the image changes.
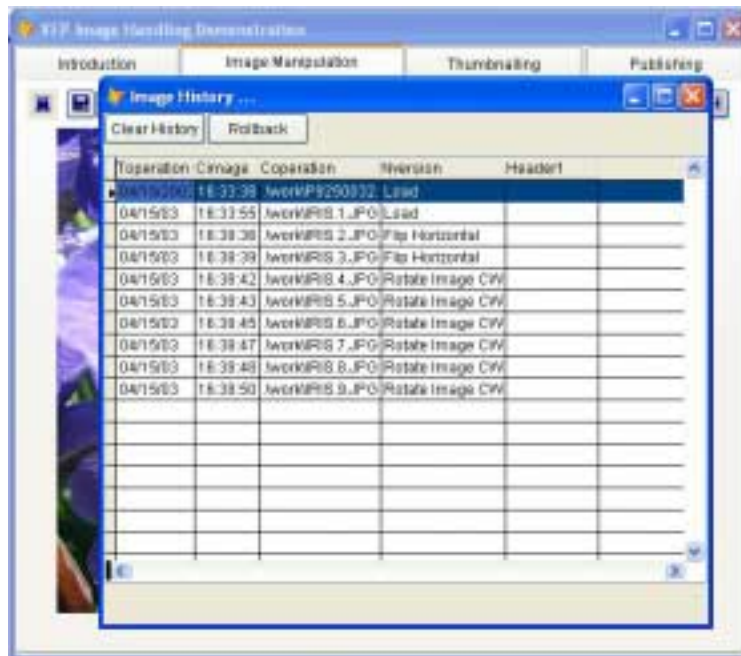

CODE SAMPLE : RotateImage CW

```
****************************************************************************************
*!* Program: RotateImageCW
*!* Author: Kevin Cully, CULLY Technologies, LLC
*!* Date: 04/07/03 06:36:12 AM
*!* Copyright:
*!* Description: Takes an image file, makes a copy of it, and then rotates the image 90 degrees CW.
*!* Revision Information:
FUNCTION RotateImageCW AS Boolean
   LOCAL llRetVal
   llRetVal = .F.
   IF VARTYPE(loImage) = "O"
      IF FILE(loImage.cWorkFile)
        lcNewWorkFile = THIS.NextWorkVersionFileName(loImage)
       IF loAPI.CopyFile(loImage.cWorkFile, lcNewWorkFile)
          loImage.cWorkFile = lcNewWorkFile
          llRetVal = RotateImage(loImage.cWorkFile, 1)            && 1 = Rotate image 90 degrees
          THIS.ImageHistory(loImage.cWorkFile, [Rotate Image CW], loImage.nVersion)
       ENDIF
      ENDIF
   ENDIF
RETURN llRetVal
ENDFUNC
```

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IMAGE HISTORY and ROLLBACK

When the user clicks the history button ("H" button). The user can select a point to rollback to. The history images are deleted as appropriate. If the user clicks on the "Clear History" button, the history images are deleted and the current image is rolled back to being version zero as if the image was just loaded. Notice that this function is slightly different than the "Save" method which removes all history and saves the current work file into the source file.

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THUMBNAILING

Images downloaded from digital cameras and other formats are normally of a size and resolution far larger than is practical for display on the web. I often thumbnail my images down to a "Web" size and then a "Thumbnail" size before publishing to the web site.

This page accomplishes the thumbnailing and the HTML creation in one step when the user clicks on the "Thumbnail Pictures" button. In this case, we're actually creating an ASP page because we want to take advantage of some advanced features of image display on the web.
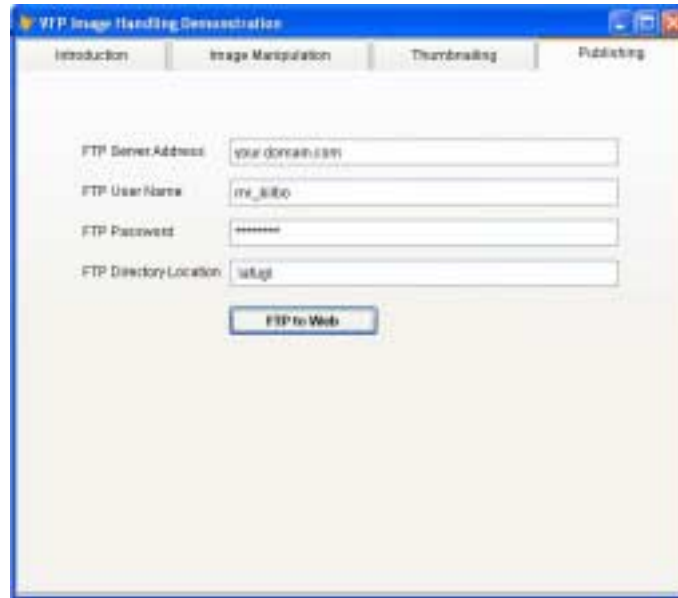
PUBLISHING

Once the images and HTML have been created and reviewed, it's time to get them to the web. Web Connection provides easy to use FTP utilities. When the user clicks on the "FTP to Web" button, the thumbnail and web size images along with the generated HTML page is transmitted to the web server.

Conclusion

These tools won't put Adobe or LeadTools out of business but they're a great extension to our language that we can use in surprising ways.

If it can't be done with FoxPro, it's not worth doing.

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