

I Wish I Knew How To ...

Implement API Declares With Xojo on Windows

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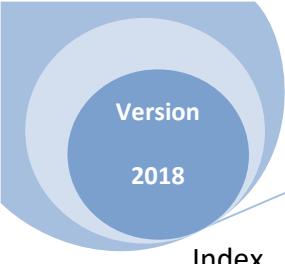
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Build a Declare - From Scratch

This example shows how to build a Declare example in Xojo from by providing all of the steps. The final program will show where the Windows OS has been installed, which is typically on the C:\ drive in the subdirectory Windows. Pressing the PBGetDirectory push button shows the directory path in the LblPath label as shown in the following screen grab.

Figure 8. Example 1-6: Xojo Screen Grab



Pressing the button causes the Windows Declare to execute and the path “C:\Windows” is shown as the Windows directory on this machine.

The first step is to build the Xojo window interface. Start Xojo and select the “Desktop” Application type and press the OK button. An empty window should appear in the Xojo IDE. Press File->Save As, and choose the file name as Example1-6. Select Window1 and change the Frame Title (**Frame** section in IDE when the Inspector button is pressed, and the default word in the Title box is **Untitled**) to Example 1-6. Press the Library button to show the possible controls in Xojo. Drag and drop two Label controls to Window1. Change the lower label control name to LblPath. Drag and drop the Default Button control in the middle of the two labels. Change the push button ID->Name to *PBGetDirectory* and change the Appearance->Caption to *Get Directory*.

To add our code, double-click pushbutton PBGetDirectory and choose the *Action* event and press the OK button. In the Action Event section add the following code:

Code 14. Example 1-6: Get Windows Directory Path

```
Sub Action() Handles Action
//x86 and x64 compatible
Const MAX_PATH = 260 //The API maximum path length is 260 (with some variance)
Dim PathLength as Integer //Actual byte length of retrieved path
Dim MyPath as MemoryBlock //Create a MemoryBlock for a pointer
MyPath = NewMemoryBlock(MAX_PATH) //The returned pointer value

#If TargetWindows then //Run in Windows OS
//Declare the C++ function in Xojo
Declare Function GetWindowsDirectory Lib "kernel32" Alias "GetWindowsDirectoryW"
(lpBuffer As Ptr, uSize As Integer) As Integer
MyPath.Long(0) = MAX_PATH //Set the first byte to the maximum path length

PathLength = GetWindowsDirectory(MyPath, MAX_PATH) //Call the declare function
LblPath.Text = MyPath.WString(0) //show path starting at 0
#Endif
End Sub
```

How was this code created? Before any code was written, the Microsoft C++ function library was viewed on the internet. In a favorite web browser and search engine, type Microsoft and GetWindowsDirectory and one of the links should provide this portion of code.

Code 15. C/C++ GetWindowsDirectory Function²

```
UINT WINAPI GetWindowsDirectory(
    _Out_    LPTSTR lpBuffer,
    _In_     UINT   uSize
);
```

C++ appears to be backwards to those familiar with writing Xojo code. Code `UINT WINAPI` means that an unsigned integer is returned to the variable `WINAPI` and the equivalent in Xojo is

² Microsoft MSDN: GetWindowsDirectory function, Retrieved 20 April 2015, from [https://msdn.microsoft.com/en-us/library/windows/desktop/ms724454\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/windows/desktop/ms724454(v=vs.85).aspx)

an Integer. The C++ function is called GetWindowsDirectory and the library is in the kernel32 dll, which must be searched on the internet. A long pointer buffer (*lpBuffer*) will receive the path, or the path is coming out (*_Out_*) of the method and is placed in the variable LPTSTR. The maximum size of the buffer (the length of the string that will hold the path string) is a value of 260 which is a constant in Windows that is typically called MAX_PATH. This means that there must be less than 260 characters in the name of the path of the returned Window path, which is a REALLY long path name.

The Xojo equivalent of this function is shown below.

Code 16. Example 1-6: Xojo Declare of C++ Function

```
Declare Function GetWindowsDirectory Lib "kernel32" Alias "GetWindowsDirectoryW" (ByVal  
lpBuffer As Ptr, ByVal uSize As Integer) As Integer
```

Xojo begins with the word Declare which means that a C++ Function or Sub will be called. The word Function means that a value is going to be returned when this function is called, and the returned value is ‘As Integer’. Two values are needed for this method and the first value is a pointer (Ptr) and the second value is an integer which hold the maximum number of bytes (or digits) that the path will hold. ByVal means that the values are going into the function.

Code in the beginning of the pushbutton action event defines three variables: 1) MAX_PATH is the maximum number of characters in the path, which is 260, 2) PathLength is the number of characters (as bytes) which the path will hold (*C:\Windows* has 10 characters which will take 10 bytes), and 3) MyPath is a MemoryBlock which is used as a pointer (Ptr) to hold the path name that will be displayed in the label *LblPath*. A new MemoryBlock is initialized with the size of 260 bytes which can hold up to 260 characters – which is a great deal of space.

An #IF-#EndIf block runs code that is specific to the Windows operating system. The Declare function is called in Xojo and it is **IMPORTANT** that the first memory block position (*MyPath.Long(0)*) has the size of the path, which is the constant value MAX_PATH of 260. GetWindowsDirectory function is called and the path (*MyPath*) is returned. To show the value in the MemoryBlock, the path is shown from the MemoryBlock position 0.

That’s it! This is how a declare is built from C++ code!

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The ‘I Wish I Knew’ series contains technical data and advice that makes sense and contains practical and numerous examples with explanations to allow you to ease into the steep programming curve. You can extend Xojo applications today!

Xojo has included more functionality and the ability to compile in 64-bit modes, and version 3.0 goes through each example to let you know if it is 32-bit (x86) or 64-bit (x64) compatible. All examples are not 64-bit compatible, compatibility was examined and attempts to compatibility were made. Attempts have been made to update code from ANSI (A – Win 95 and Win98) to Unicode (W – WinNT and newer OS’s). Code is compatible with Xojo 2018 r3 and Windows 10.

This book “I Wish I Knew How to ... Implement API Declares with Xojo on Windows V 3.0” shows you how to use the powerful Operating System commands to customize your program. This book will likely be updated with more examples as there are so many possibilities and options with the Windows Operating System.

This book provides many examples that are converted from C++ functions to Xojo. Although there are many Visual Basic examples that can be converted, vb declare example are becoming outdated, have different parameters, or contain misinformation. For these reasons converting from C++ to Xojo is a long-lasting alternative and which this book provides many descriptions, reasons, references, and working examples for Xojo declares.

There are 25 chapters and contains over 900 pages with over 140 example programs. Examples include creating controls, a new window, GDI, Pens, brushes, Structures, Files, LoWord, audio players, more controls, and much more. Many screenshots have been added to show the results of the code with an index to help find topics quickly.

This is one of many books at xDevLibrary. This book can be purchased at <http://XojoLibrary.com> where many great Xojo resources are available.

Happy programming!

Eugene

Eugene Dakin MBA, Ph.D., P.Chem., is an author of Xojo reference materials and has many years of experience in the programming industry. Another great reference book is *I Wish I Knew How To ... Program SQLite*.

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