wxWindows 2.2: A portable C++ and Python GUI toolkit

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Contents

Chapter 1 Copyright notice

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```
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library `Frob' (a library for tweaking knobs) written by James Random
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<signature of Ty Coon>, 1 April 1990
Ty Coon, President of Vice
```

That's all there is to it!

Chapter 2 Introduction

What is wxWindows?

wxWindows is a C++ framework providing GUI (Graphical User Interface) and other facilities on more than one platform. Version 2 currently supports MS Windows (16-bit, Windows 95 and Windows NT), Unix with GTK+, Unix with Motif, and Mac. An OS/2 port is in progress.

wxWindows was originally developed at the Artificial Intelligence Applications Institute, University of Edinburgh, for internal use, and was first made publicly available in 1993. Version 2 is a vastly improved version written and maintained by Julian Smart, Robert Roebling, Vadim Zeitlin and many others.

This manual discusses wxWindows in the context of multi-platform development.

Please note that in the following, "MS Windows" often refers to all platforms related to Microsoft Windows, including 16-bit and 32-bit variants, unless otherwise stated. All trademarks are acknowledged.

Why another cross-platform development tool?

wxWindows was developed to provide a cheap and flexible way to maximize investment in GUI application development. While a number of commercial class libraries already existed for cross-platform development, none met all of the following criteria:

1. low price;
2. source availability;
3. simplicity of programming;
4. support for a wide range of compilers.

Since wxWindows was started, several other free or almost-free GUI frameworks have emerged. However, none has the range of features, flexibility, documentation and the well-established development team that wxWindows has.

As open source software, wxWindows has benefited from comments, ideas, bug fixes, enhancements and the sheer enthusiasm of users. This gives wxWindows a certain advantage over its commercial competitors (and over free libraries without an independent development team), plus a robustness against the transience of one individual or company. This openness and availability of source code is especially important when the future of thousands of lines of application code may depend upon the longevity of the underlying class library.

Version 2 goes much further than previous versions in terms of generality and features, allowing applications to be produced that are often indistinguishable from those produced using single-platform toolkits such as Motif, GTK+ and MFC.

The importance of using a platform-independent class library cannot be overstated, since GUI application development is very time-consuming, and sustained popularity of particular GUIs cannot be guaranteed. Code can very quickly become obsolete if it addresses the wrong platform or audience. wxWindows helps to insulate the programmer from these winds of change. Although wxWindows may not be suitable for every application (such as an OLE-intensive program), it provides access to most of the functionality a GUI program normally requires, plus many extras such as network programming, PostScript output, and HTML rendering; and it can of course be extended as needs dictate. As a bonus, it provides a far cleaner and easier programming interface than the native APIs. Programmers may find it worthwhile to use wxWindows even if they are developing on only one platform.

It is impossible to sum up the functionality of wxWindows in a few paragraphs, but here are some of the benefits:

- Low cost (free, in fact!)
- You get the source.
- Available on a variety of popular platforms.
- Works with almost all popular C++ compilers and Python.
- Over 50 example programs.
- Over 1000 pages of printable and on-line documentation.
- Includes Tex2RTF, to allow you to produce your own documentation in Windows Help, HTML and Word RTF formats.
- Simple-to-use, object-oriented API.
- Flexible event system.
- Graphics calls include lines, rounded rectangles, splines, polylines, etc.
- Constraint-based and sizer-based layouts.
- Print/preview and document/view architectures.
- Toolbar, notebook, tree control, advanced list control classes.
- PostScript generation under Unix, normal MS Windows printing on the PC.
- MDI (Multiple Document Interface) support.
- Can be used to create DLLs under Windows, dynamic libraries on Unix.
- Common dialogs for file browsing, printing, colour selection, etc.
- Under MS Windows, support for creating metafiles and copying them to the clipboard.
- An API for invoking help from applications.
- Ready-to-use HTML window (supporting a subset of HTML).
- Dialog Editor for building dialogs.
- Network support via a family of socket and protocol classes.
- Support for platform independent image processing.
- Built-in support for many file formats (BMP, PNG, JPEG, GIF, XPM, PNM, PCX).

Changes from version 1.xx

These are a few of the major differences between versions 1.xx and 2.0.

Removals:

- XView is no longer supported;
- all controls (panel items) no longer have labels attached to them;
- wxForm has been removed;
- wxCanvasDC, wxPanelDC removed (replaced by wxClientDC, wxWindowDC, wxPaintDC which can be used for any window);
- wxMultiText, wxTextWindow, wxText removed and replaced by wxTextCtrl;
- classes no longer divided into generic and platform-specific parts, for efficiency.

Additions and changes:

- class hierarchy changed, and restrictions about subwindow nesting lifted;
- header files reorganized to conform to normal C++ standards;
- classes less dependent on each another, to reduce executable size;
- wxString used instead of char* wherever possible;
- the number of separate but mandatory utilities reduced;
- the event system has been overhauled, with virtual functions and callbacks being replaced with MFC-like event tables;
- new controls, such as wxTreeCtrl, wxListCtrl, wxSpinButton;
- less inconsistency about what events can be handled, so for example mouse clicks or key presses on controls can now be intercepted;
- the status bar is now a separate class, wxStatusBar, and is implemented in generic wxWindows code;
- some renaming of controls for greater consistency;
- wxBitmap has the notion of bitmap handlers to allow for extension to new formats without ifdefing;
- new dialogs: wxPageSetupDialog, wxFileDialog, wxDirDialog, wxMessageDialog, wxSingleChoiceDialog, wxTextEntryDialog;
- GDI objects are reference-counted and are now passed to most functions by reference, making memory management far easier;
- wxSystemSettings class allows querying for various system-wide properties such as dialog font, colours, user interface element sizes, and so on;
- better platform look and feel conformance;
- toolbar functionality now separated out into a family of classes with the same API;
- device contexts are no longer accessed using wxWindow::GetDC - they are created temporarily with the window as an argument;
- events from sliders and scrollbars can be handled more flexibly;
- the handling of window close events has been changed in line with the new event system;
- the concept of *validator* has been added to allow much easier coding of the relationship between controls and application data;

- the documentation has been revised, with more cross-referencing.

Platform-specific changes:

- The Windows header file (windows.h) is no longer included by wxWindows headers;
- wx.dll supported under Visual C++;
- the full range of Windows 95 window decorations are supported, such as modal frame borders;
- MDI classes brought out of wxFrame into separate classes, and made more flexible.

Changes from version 2.0

These are a few of the differences between versions 2.0 and 2.2.

Removals:

- GTK 1.0 no longer supported.

Additions and changes:

- Corrected many classes to conform better to documented behaviour.
- Added handlers for more image formats (Now GIF, JPEG, PCX, BMP, XPM, PNG, PNM).
- Improved support for socket and network functions.
- Support for different national font encodings.
- Sizer based layout system.
- HTML widget and help system.
- Added some controls (e.g. wxSpinCtrl) and supplemented many.
- Many optical improvements to GTK port.
- Support for menu accelerators in GTK port.
- Enhanced and improved support for scrolling, including child windows.
- Complete rewrite of clipboard and drag and drop classes.
- Improved support for ODBC databases.
- Improved tab traversal in dialogs.

wxWindows requirements

To make use of wxWindows, you currently need one or both of the following setups.

(a) PC:

1. A 486 or higher PC running MS Windows.
2. A Windows compiler: most are supported, but please see `install.txt` for details. Supported compilers include Microsoft Visual C++ 4.0 or higher, Borland C++, Cygwin, Metrowerks CodeWarrior.
3. At least 60 MB of disk space.

(b) Unix:

1. Almost any C++ compiler, including GNU C++ (EGCS 1.1.1 or above).
2. Almost any Unix workstation, and one of: GTK+ 1.2, Motif 1.2 or higher, Lesstif.
3. At least 60 MB of disk space.

Availability and location of wxWindows

wxWindows is available by anonymous FTP and World Wide Web from ftp://www.remstar.com/pub/wxwin (`ftp://www.remstar.com/pub/wxwin`) and/or http://www.wxwindows.org (`http://www.wxwindows.org`).

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Acknowledgments

Thanks are due to AIAI for being willing to release the original version of wxWindows into the public domain, and to our patient partners.

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Chapter 3 Multi-platform development with wxWindows

This chapter describes the practical details of using wxWindows. Please see the file install.txt for up-to-date installation instructions, and changes.txt for differences between versions.

Include files

The main include file is `"wx/wx.h"`; this includes the most commonly used modules of wxWindows.

To save on compilation time, include only those header files relevant to the source file. If you are using precompiled headers, you should include the following section before any other includes:

```
// For compilers that support precompilation, includes "wx.h".
#include <wx/wxprec.h>

#ifdef __BORLANDC__
#pragma hdrstop
#endif

#ifndef WX_PRECOMP
// Include your minimal set of headers here, or wx.h
#include <wx/wx.h>
#endif

... now your other include files ...
```

The file `"wx/wxprec.h"` includes `"wx/wx.h"`. Although this incantation may seem quirky, it is in fact the end result of a lot of experimentation, and several Windows compilers to use precompilation (those tested are Microsoft Visual C++, Borland C++ and Watcom C++).

Borland precompilation is largely automatic. Visual C++ requires specification of `"wx/wxprec.h"` as the file to use for precompilation. Watcom C++ is automatic apart from the specification of the .pch file. Watcom C++ is strange in requiring the precompiled header to be used only for object files compiled in the same directory as that in which the precompiled header was created. Therefore, the wxWindows Watcom C++ makefiles go through hoops deleting and recreating a single precompiled header file for each module, thus preventing an accumulation of many multi-megabyte .pch files.

Libraries

The GTK and Motif ports of wxWindow can create either a static library or a shared library on most Unix or Unix-like systems. The static library is called libwx_gtk.a and libwx_motif.a whereas the name of the shared library is dependent on the system it is created on and the version you are using. The library name for the GTK version of wxWindows 2.2 on Linux and Solaris will be libwx_gtk-2.2.so.0.0.0, on HP-UX, it will be libwx_gtk-2.2.sl, on AIX just libwx_gtk.a etc.

Under Windows, use the library wx.lib (release) or wxd.lib (debug) for stand-alone Windows applications, or wxdll.lib (wxdlld.lib) for creating DLLs.

Configuration

Options are configurable in the file `"wx/XXX/setup.h"` where XXX is the required platform (such as msw, motif, gtk, mac). Some settings are a matter of taste, some help with platform-specific problems, and others can be set to minimize the size of the library. Please see the setup.h file and `install.txt` files for details on configuration.

Under Unix (GTK and Motif) the corresponding setup.h files are generated automatically when configuring the wxWindows using the "configure" script. When using the RPM packages for installing wxWindows on Linux, a correct setup.h is shipped in the package and this must not be changed.

Makefiles

At the moment there is no attempt to make Unix makefiles and PC makefiles compatible, i.e. one makefile is required for each environment. The Unix ports use a sophisticated system based on the GNU autoconf tool and this system will create the makefiles as required on the respective platform. Although the makefiles are not identical in Windows, Mac and Unix, care has been taken to make them relatively similar so that moving from one platform to another will be painless.

Sample makefiles for Unix (suffix .unx), MS C++ (suffix .DOS and .NT), Borland C++ (.BCC and .B32) and Symantec C++ (.SC) are included for the library, demos and utilities.

The controlling makefile for wxWindows is in the MS-Windows directory `src/msw` for the different Windows compiler and in the build directory when using the Unix ports. The build directory can be chosen by the user. It is the directory in which the "configure" script is run. This can be the normal base directory (by running `./configure` there) or any other directory (e.g. `../configure` after creating a build-directory in the directory level above the base directory).

Please see the platform-specific `install.txt` file for further details.

Windows-specific files

wxWindows application compilation under MS Windows requires at least two extra files, resource and module definition files.

Resource file

The least that must be defined in the Windows resource file (extension RC) is the following statement:

```
rcinclude "wx/msw/wx.rc"
```

which includes essential internal wxWindows definitions. The resource script may also contain references to icons, cursors, etc., for example:

```
wxicon icon wx.ico
```

The icon can then be referenced by name when creating a frame icon. See the MS Windows SDK documentation.

Note: include wx.rc *after* any ICON statements so programs that search your executable for icons (such as the Program Manager) find your application icon first.

Module definition file

A module definition file (extension DEF) is required for 16-bit applications, and looks like the following:

```
NAME          Hello
DESCRIPTION   'Hello'
EXETYPE       WINDOWS
STUB          'WINSTUB.EXE'
CODE          PRELOAD MOVEABLE DISCARDABLE
DATA          PRELOAD MOVEABLE MULTIPLE
HEAPSIZE      1024
STACKSIZE     8192
```

The only lines which will usually have to be changed per application are NAME and DESCRIPTION.

Allocating and deleting wxWindows objects

In general, classes derived from wxWindow must dynamically allocated with *new* and deleted with *delete*. If you delete a window, all of its children and descendants will be automatically deleted, so you don't need to delete these descendants explicitly.

When deleting a frame or dialog, use **Destroy** rather than **delete** so that the wxWindows delayed deletion can take effect. This waits until idle time (when all messages have been processed) to actually delete the window, to avoid problems associated with the GUI sending events to deleted windows.

Don't create a window on the stack, because this will interfere with delayed deletion.

If you decide to allocate a C++ array of objects (such as wxBitmap) that may be cleaned up by wxWindows, make sure you delete the array explicitly before wxWindows has a chance to do so on exit, since calling *delete* on array members will cause memory problems.

wxColour can be created statically: it is not automatically cleaned up and is unlikely to be shared between other objects; it is lightweight enough for copies to be made.

Beware of deleting objects such as a wxPen or wxBitmap if they are still in use. Windows is particularly sensitive to this: so make sure you make calls like wxDC::SetPen(wxNullPen) or wxDC::SelectObject(wxNullBitmap) before deleting a drawing object that may be in use. Code that doesn't do this will probably work fine on some platforms, and then fail under Windows.

Architecture dependency

A problem which sometimes arises from writing multi-platform programs is that the basic C types are not defined the same on all platforms. This holds true for both the length in bits of the standard types (such as int and long) as well as their byte order, which might be little endian (typically on Intel computers) or big endian (typically on some Unix workstations). wxWindows defines types and macros that make it easy to write architecture independent code. The types are:

wxInt32, wxInt16, wxInt8, wxUint32, wxUint16 = wxWord, wxUint8 = wxByte

where wxInt32 stands for a 32-bit signed integer type etc. You can also check which architecture the program is compiled on using the wxBYTE_ORDER define which is either wxBIG_ENDIAN or wxLITTLE_ENDIAN (in the future maybe wxPDP_ENDIAN as well).

The macros handling bit-swapping with respect to the applications endianness are described in the *Macros* (p. 1292) section.

Conditional compilation

One of the purposes of wxWindows is to reduce the need for conditional compilation in source code, which can be messy and confusing to follow. However, sometimes it is necessary to incorporate platform-specific features (such as metafile use under MS Windows). The symbols listed in the file `symbols.txt` may be used for this purpose, along with any user-supplied ones.

C++ issues

The following documents some miscellaneous C++ issues.

Templates

wxWindows does not use templates since it is a notoriously unportable feature.

RTTI

wxWindows does not use run-time type information since wxWindows provides its own run-time type information system, implemented using macros.

Type of NULL

Some compilers (e.g. the native IRIX cc) define NULL to be 0L so that no conversion to pointers is allowed. Because of that, all these occurrences of NULL in the GTK port use an explicit conversion such as

```
wxWindow *my_window = (wxWindow*) NULL;
```

It is recommended to adhere to this in all code using wxWindows as this make the code (a bit) more portable.

Precompiled headers

Some compilers, such as Borland C++ and Microsoft C++, support precompiled headers. This can save a great deal of compiling time. The recommended approach is to precompile `"wx.h"`, using this precompiled header for compiling both wxWindows itself and any wxWindows applications. For Windows compilers, two dummy source files are

provided (one for normal applications and one for creating DLLs) to allow initial creation of the precompiled header.

However, there are several downsides to using precompiled headers. One is that to take advantage of the facility, you often need to include more header files than would normally be the case. This means that changing a header file will cause more recompilations (in the case of wxWindows, everything needs to be recompiled since everything includes `"wx.h"`!)

A related problem is that for compilers that don't have precompiled headers, including a lot of header files slows down compilation considerably. For this reason, you will find (in the common X and Windows parts of the library) conditional compilation that under Unix, includes a minimal set of headers; and when using Visual C++, includes `wx.h`. This should help provide the optimal compilation for each compiler, although it is biased towards the precompiled headers facility available in Microsoft C++.

File handling

When building an application which may be used under different environments, one difficulty is coping with documents which may be moved to different directories on other machines. Saving a file which has pointers to full pathnames is going to be inherently unportable. One approach is to store filenames on their own, with no directory information. The application searches through a number of locally defined directories to find the file. To support this, the class **wxPathList** makes adding directories and searching for files easy, and the global function **wxFileNameFromPath** allows the application to strip off the filename from the path if the filename must be stored. This has undesirable ramifications for people who have documents of the same name in different directories.

As regards the limitations of DOS 8+3 single-case filenames versus unrestricted Unix filenames, the best solution is to use DOS filenames for your application, and also for document filenames *if* the user is likely to be switching platforms regularly. Obviously this latter choice is up to the application user to decide. Some programs (such as YACC and LEX) generate filenames incompatible with DOS; the best solution here is to have your Unix makefile rename the generated files to something more compatible before transferring the source to DOS. Transferring DOS files to Unix is no problem, of course, apart from EOL conversion for which there should be a utility available (such as dos2unix).

See also the File Functions section of the reference manual for descriptions of miscellaneous file handling functions.

Chapter 4 Programming strategies

This chapter is intended to list strategies that may be useful when writing and debugging wxWindows programs. If you have any good tips, please submit them for inclusion here.

Strategies for reducing programming errors

Use ASSERT

Although I haven't done this myself within wxWindows, it is good practice to use ASSERT statements liberally, that check for conditions that should or should not hold, and print out appropriate error messages. These can be compiled out of a non-debugging version of wxWindows and your application. Using ASSERT is an example of 'defensive programming': it can alert you to problems later on.

Use wxString in preference to character arrays

Using wxString can be much safer and more convenient than using char *. Again, I haven't practiced what I'm preaching, but I'm now trying to use wxString wherever possible. You can reduce the possibility of memory leaks substantially, and it is much more convenient to use the overloaded operators than functions such as strcmp. wxString won't add a significant overhead to your program; the overhead is compensated for by easier manipulation (which means less code).

The same goes for other data types: use classes wherever possible.

Strategies for portability

Use relative positioning or constraints

Don't use absolute panel item positioning if you can avoid it. Different GUIs have very differently sized panel items. Consider using the constraint system, although this can be complex to program.

Alternatively, you could use alternative .wrc (wxWindows resource files) on different platforms, with slightly different dimensions in each. Or space your panel items out to avoid problems.

Use wxWindows resource files

Use .wrc (wxWindows resource files) where possible, because they can be easily changed independently of source code. Bitmap resources can be set up to load different kinds of bitmap depending on platform (see the section on resource files).

Strategies for debugging

Positive thinking

It is common to blow up the problem in one's imagination, so that it seems to threaten weeks, months or even years of work. The problem you face may seem insurmountable: but almost never is. Once you have been programming for some time, you will be able to remember similar incidents that threw you into the depths of despair. But remember, you always solved the problem, somehow!

Perseverance is often the key, even though a seemingly trivial problem can take an apparently inordinate amount of time to solve. In the end, you will probably wonder why you worried so much. That's not to say it isn't painful at the time. Try not to worry -- there are many more important things in life.

Simplify the problem

Reduce the code exhibiting the problem to the smallest program possible that exhibits the problem. If it is not possible to reduce a large and complex program to a very small program, then try to ensure your code doesn't hide the problem (you may have attempted to minimize the problem in some way: but now you want to expose it).

With luck, you can add a small amount of code that causes the program to go from functioning to non-functioning state. This should give a clue to the problem. In some cases though, such as memory leaks or wrong deallocation, this can still give totally spurious results!

Use a debugger

This sounds like facetious advice, but it is surprising how often people don't use a debugger. Often it is an overhead to install or learn how to use a debugger, but it really is essential for anything but the most trivial programs.

Use logging functions

There is a variety of logging functions that you can use in your program: see *Logging functions* (p. 1304).

Using tracing statements may be more convenient than using the debugger in some circumstances (such as when your debugger doesn't support a lot of debugging code, or you wish to print a bunch of variables).

Use the wxWindows debugging facilities

You can use wxDebugContext to check for memory leaks and corrupt memory: in fact in debugging mode, wxWindows will automatically check for memory leaks at the end of the program if wxWindows is suitably configured. Depending on the operating system and compiler, more or less specific information about the problem will be logged.

You should also use *debug macros* (p. 1308) as part of a 'defensive programming' strategy, scattering wxASSERTs liberally to test for problems in your code as early as possible. Forward thinking will save a surprising amount of time in the long run.

See the *debugging overview* (p. 1363) for further information.

Check Windows debug messages

Under Windows, it is worth running your program with DbgView (`http://www.sysinternals.com`) running or some other program that shows Windows-generated debug messages. It is possible it will show invalid handles being used. You may have fun seeing what commercial programs cause these normally hidden errors! Microsoft recommend using the debugging version of Windows, which shows up even more problems. However, I doubt it is worth the hassle for most applications. wxWindows is designed to minimize the possibility of such errors, but they can still happen occasionally, slipping through unnoticed because they are not severe enough to cause a crash.

Genetic mutation

If we had sophisticated genetic algorithm tools that could be applied to programming, we could use them. Until then, a common -- if rather irrational -- technique is to just make arbitrary changes to the code until something different happens. You may have an intuition why a change will make a difference; otherwise, just try altering the order of code, comment lines out, anything to get over an impasse. Obviously, this is usually a last resort.

Chapter 5 Alphabetical class reference

wxAcceleratorEntry

An object used by an application wishing to create an *accelerator table* (p. 17).

Derived from

None

Include files

<wx/accel.h>

See also

wxAcceleratorTable (p. 17), *wxWindow::SetAcceleratorTable* (p. 1227)

wxAcceleratorEntry::wxAcceleratorEntry

wxAcceleratorEntry()

Default constructor.

wxAcceleratorEntry(**int** *flags*, **int** *keyCode*, **int** *cmd*)

Constructor.

Parameters

flags
> One of wxACCEL_ALT, wxACCEL_SHIFT, wxACCEL_CTRL and
> wxACCEL_NORMAL. Indicates which modifier key is held down.

keyCode
> The keycode to be detected. See *Keycodes* (p. 1311) for a full list of keycodes.

cmd
> The menu or control command identifier.

wxAcceleratorEntry::GetCommand

int GetCommand() **const**

Returns the command identifier for the accelerator table entry.

wxAcceleratorEntry::GetFlags

int GetFlags() **const**

Returns the flags for the accelerator table entry.

wxAcceleratorEntry::GetKeyCode

int GetKeyCode() **const**

Returns the keycode for the accelerator table entry.

wxAcceleratorEntry::Set

void Set(**int** *flags*, **int** *keyCode*, **int** *cmd*)

Sets the accelerator entry parameters.

Parameters

flags
> One of wxACCEL_ALT, wxACCEL_SHIFT, wxACCEL_CTRL and wxACCEL_NORMAL. Indicates which modifier key is held down.

keyCode
> The keycode to be detected. See *Keycodes* (p. 1311) for a full list of keycodes.

cmd
> The menu or control command identifier.

wxAcceleratorTable

An accelerator table allows the application to specify a table of keyboard shortcuts for menus or other commands. On Windows, menu or button commands are supported; on GTK, only menu commands are supported.

The object **wxNullAcceleratorTable** is defined to be a table with no data, and is the initial accelerator table for a window.

Derived from

wxObject (p. 750)

Include files

<wx/accel.h>

Example

```
wxAcceleratorEntry entries[4];
entries[0].Set(wxACCEL_CTRL,  (int) 'N',     ID_NEW_WINDOW);
entries[1].Set(wxACCEL_CTRL,  (int) 'X',     wxID_EXIT);
entries[2].Set(wxACCEL_SHIFT, (int) 'A',     ID_ABOUT);
entries[3].Set(wxACCEL_NORMAL,  WXK_DELETE,    wxID_CUT);
wxAcceleratorTable accel(4, entries);
frame->SetAcceleratorTable(accel);
```

Remarks

An accelerator takes precedence over normal processing and can be a convenient way to program some event handling. For example, you can use an accelerator table to enable a dialog with a multi-line text control to accept CTRL-Enter as meaning 'OK' (but not in GTK at present).

See also

wxAcceleratorEntry (p. 16), *wxWindow::SetAcceleratorTable* (p. 1227)

wxAcceleratorTable::wxAcceleratorTable

wxAcceleratorTable()

Default constructor.

wxAcceleratorTable(**const wxAcceleratorTable&** *bitmap*)

Copy constructor.

wxAcceleratorTable(**int** *n*, **wxAcceleratorEntry** *entries[]*)

Creates from an array of *wxAcceleratorEntry* (p. 16) objects.

wxAcceleratorTable(**const wxString&** *resource*)

Loads the accelerator table from a Windows resource (Windows only).

Parameters

n
　　Number of accelerator entries.

entries
　　The array of entries.

resource
　　Name of a Windows accelerator.

wxPython note: The wxPython constructor accepts a list of wxAcceleratorEntry objects, or 3-tuples consisting of flags, keyCode, and cmd values like you would construct wxAcceleratorEntry objects with.

wxAcceleratorTable::~wxAcceleratorTable

~wxAcceleratorTable ()

Destroys the wxAcceleratorTable object.

wxAcceleratorTable::Ok

bool Ok() **const**

Returns TRUE if the accelerator table is valid.

wxAcceleratorTable::operator =

wxAcceleratorTable& operator =(**const wxAcceleratorTable&** *accel*)

Assignment operator. This operator does not copy any data, but instead passes a pointer to the data in *accel* and increments a reference counter. It is a fast operation.

Parameters

accel
　　Accelerator table to assign.

Return value

Returns reference to this object.

wxAcceleratorTable::operator ==

bool operator ==(**const wxAcceleratorTable&** *accel*)

Equality operator. This operator tests whether the internal data pointers are equal (a fast test).

Parameters

accel
    Accelerator table to compare with

Return value

Returns TRUE if the accelerator tables were effectively equal, FALSE otherwise.

wxAcceleratorTable::operator !=

bool operator !=(**const wxAcceleratorTable&** *accel*)

Inequality operator. This operator tests whether the internal data pointers are unequal (a fast test).

Parameters

accel
    Accelerator table to compare with

Return value

Returns TRUE if the accelerator tables were unequal, FALSE otherwise.

wxActivateEvent

An activate event is sent when a window or application is being activated or deactivated.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process an activate event, use these event handler macros to direct input to a

member function that takes a wxActivateEvent argument.

EVT_ACTIVATE(func)   Process a wxEVT_ACTIVATE event.
EVT_ACTIVATE_APP(func)   Process a wxEVT_ACTIVATE_APP event.

Remarks

A top-level window (a dialog or frame) receives an activate event when is being activated or deactivated. This is indicated visually by the title bar changing colour, and a subwindow gaining the keyboard focus.

An application is activated or deactivated when one of its frames becomes activated, or a frame becomes inactivate resulting in all application frames being inactive. (Windows only)

See also

wxWindow::OnActivate (p. 1211), *wxApp::OnActivate* (p. 25), *Event handling overview* (p. 1372)

wxActivateEvent::wxActivateEvent

wxActivateEvent(**WXTYPE** *eventType = 0*, **bool** *active = TRUE*, **int** *id = 0*)

Constructor.

wxActivateEvent::m_active

bool m_active

TRUE if the window or application was activated.

wxActivateEvent::GetActive

bool GetActive() **const**

Returns TRUE if the application or window is being activated, FALSE otherwise.

wxApp

The **wxApp** class represents the application itself. It is used to:

- set and get application-wide properties;
- implement the windowing system message or event loop;
- initiate application processing via *wxApp::OnInit* (p. 28);
- allow default processing of events not handled by other objects in the application.

You should use the macro IMPLEMENT_APP(appClass) in your application implementation file to tell wxWindows how to create an instance of your application class.

Use DECLARE_APP(appClass) in a header file if you want the wxGetApp function (which returns a reference to your application object) to be visible to other files.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/app.h>

See also

wxApp overview (p. 1336)

wxApp::wxApp

void wxApp()

Constructor. Called implicitly with a definition of a wxApp object.

wxApp::~wxApp

void ~wxApp()

Destructor. Will be called implicitly on program exit if the wxApp object is created on the stack.

wxApp::argc

int argc

Number of command line arguments (after environment-specific processing).

wxApp::argv

char ** argv

Command line arguments (after environment-specific processing).

wxApp::CreateLogTarget

virtual wxLog* CreateLogTarget()

Creates a wxLog class for the application to use for logging errors. The default implementation returns a new wxLogGui class.

See also

wxLog (p. 655)

wxApp::Dispatch

void Dispatch()

Dispatches the next event in the windowing system event queue.

This can be used for programming event loops, e.g.

```
while (app.Pending())
  Dispatch();
```

See also

wxApp::Pending (p. 29)

wxApp::GetAppName

wxString GetAppName() **const**

Returns the application name.

Remarks

wxWindows sets this to a reasonable default before calling *wxApp::OnInit* (p. 28), but the application can reset it at will.

wxApp::GetAuto3D

bool GetAuto3D() const

Returns TRUE if 3D control mode is on, FALSE otherwise.

See also

wxApp::SetAuto3D (p. 30)

wxApp::GetClassName

wxString GetClassName() const

Gets the class name of the application. The class name may be used in a platform specific manner to refer to the application.

See also

wxApp::SetClassName (p. 30)

wxApp::GetExitOnFrameDelete

bool GetExitFrameOnDelete() const

Returns TRUE if the application will exit when the top-level window is deleted, FALSE otherwise.

See also

wxApp::SetExitOnFrameDelete (p. 31)

wxApp::GetTopWindow

wxWindow * GetTopWindow() const

Returns a pointer to the top window.

Remarks

If the top window hasn't been set using *wxApp::SetTopWindow* (p. 31), this function will find the first top-level window (frame or dialog) and return that.

See also

SetTopWindow (p. 31)

wxApp::GetUseBestVisual

bool GetUseBestVisual() **const**

Returns TRUE if the application will use the best visual on systems that support different visuals, FALSE otherwise.

See also

SetUseBestVisual (p. 32)

wxApp::GetVendorName

wxString GetVendorName() **const**

Returns the application's vendor name.

wxApp::ExitMainLoop

void ExitMainLoop()

Call this to explicitly exit the main message (event) loop. You should normally exit the main loop (and the application) by deleting the top window.

wxApp::Initialized

bool Initialized()

Returns TRUE if the application has been initialized (i.e. if *wxApp::OnInit* (p. 28) has returned successfully). This can be useful for error message routines to determine which method of output is best for the current state of the program (some windowing systems may not like dialogs to pop up before the main loop has been entered).

wxApp::MainLoop

int MainLoop()

Called by wxWindows on creation of the application. Override this if you wish to provide your own (environment-dependent) main loop.

Return value

Returns 0 under X, and the wParam of the WM_QUIT message under Windows.

wxApp::OnActivate

void OnActivate(**wxActivateEvent&** *event*)

Provide this member function to know whether the application is being activated or deactivated (Windows only).

See also

wxWindow::OnActivate (p. 1211), *wxActivateEvent* (p. 20)

wxApp::OnExit

int OnExit()

Provide this member function for any processing which needs to be done as the application is about to exit.

wxApp::OnCharHook

void OnCharHook(**wxKeyEvent&** *event*)

This event handler function is called (under Windows only) to allow the window to intercept keyboard events before they are processed by child windows.

Parameters

event
     The keypress event.

Remarks

Use the wxEVT_CHAR_HOOK macro in your event table.

If you use this member, you can selectively consume keypress events by calling *wxEvent::Skip* (p. 380) for characters the application is not interested in.

See also

wxKeyEvent (p. 610), *wxWindow::OnChar* (p. 1211), *wxWindow::OnCharHook* (p. 1212), *wxDialog::OnCharHook* (p. 316)

wxApp::OnFatalException

void OnFatalException()

This function may be called if something fatal happens: an unhandled exception under Win32 or a a fatal signal under Unix, for example. However, this will not happen by

default: you have to explicitly call *wxHandleFatalExceptions* (p. 1285) to enable this.

Generally speaking, this function should only show a message to the user and return. You may attempt to save unsaved data but this is not guaranteed to work and, in fact, probably won't.

See also

wxHandleFatalExcetions (p. 1285)

wxApp::OnIdle

void OnIdle (**wxIdleEvent&** *event*)

Override this member function for any processing which needs to be done when the application is idle. You should call wxApp::OnIdle from your own function, since this forwards OnIdle events to windows and also performs garbage collection for windows whose destruction has been delayed.

wxWindows' strategy for OnIdle processing is as follows. After pending user interface events for an application have all been processed, wxWindows sends an OnIdle event to the application object. wxApp::OnIdle itself sends an OnIdle event to each application window, allowing windows to do idle processing such as updating their appearance. If either wxApp::OnIdle or a window OnIdle function requested more time, by caling *wxIdleEvent::RequestMore* (p. 561), wxWindows will send another OnIdle event to the application object. This will occur in a loop until either a user event is found to be pending, or OnIdle requests no more time. Then all pending user events are processed until the system goes idle again, when OnIdle is called, and so on.

See also

wxWindow::OnIdle (p. 1217), *wxIdleEvent* (p. 560), *wxWindow::SendIdleEvents* (p. 29)

wxApp::OnEndSession

void OnEndSession(**wxCloseEvent&** *event*)

This is an event handler function called when the operating system or GUI session is about to close down. The application has a chance to silently save information, and can optionally close itself.

Use the EVT_END_SESSION event table macro to handle query end session events.

The default handler calls *wxWindow::Close* (p. 1195) with a TRUE argument (forcing the application to close itself silently).

Remarks

Under X, OnEndSession is called in response to the 'die' event.

Under Windows, OnEndSession is called in response to the WM_ENDSESSION message.

See also

wxWindow::Close (p. 1195), *wxWindow::OnCloseWindow* (p. 1213), *wxCloseEvent* (p. 125), *wxApp::OnQueryEndSession* (p. 28)

wxApp::OnInit

bool OnInit()

This must be provided by the application, and will usually create the application's main window, optionally calling *wxApp::SetTopWindow* (p. 31).

Return TRUE to continue processing, FALSE to exit the application.

wxApp::OnQueryEndSession

void OnQueryEndSession(wxCloseEvent& *event*)

This is an event handler function called when the operating system or GUI session is about to close down. Typically, an application will try to save unsaved documents at this point.

If *wxCloseEvent::CanVeto* (p. 125) returns TRUE, the application is allowed to veto the shutdown by calling *wxCloseEvent::Veto* (p. 126). The application might veto the shutdown after prompting for documents to be saved, and the user has cancelled the save.

Use the EVT_QUERY_END_SESSION event table macro to handle query end session events.

You should check whether the application is forcing the deletion of the window using *wxCloseEvent::GetForce* (p. 126). If this is TRUE, destroy the window using *wxWindow::Destroy* (p. 1198). If not, it is up to you whether you respond by destroying the window.

The default handler calls *wxWindow::Close* (p. 1195) on the top-level window, and vetoes the shutdown if Close returns FALSE. This will be sufficient for many applications.

Remarks

Under X, OnQueryEndSession is called in response to the 'save session' event.

Under Windows, OnQueryEndSession is called in response to the WM_QUERYENDSESSION message.

See also

wxWindow::Close (p. 1195), *wxWindow::OnCloseWindow* (p. 1213), *wxCloseEvent* (p. 125), *wxApp::OnEndSession* (p. 27)

wxApp::ProcessMessage

bool ProcessMessage (MSG *msg)

Windows-only function for processing a message. This function is called from the main message loop, checking for windows that may wish to process it. The function returns TRUE if the message was processed, FALSE otherwise. If you use wxWindows with another class library with its own message loop, you should make sure that this function is called to allow wxWindows to receive messages. For example, to allow co-existance with the Microsoft Foundation Classes, override the PreTranslateMessage function:

```
// Provide wxWindows message loop compatibility
BOOL CTheApp::PreTranslateMessage(MSG *msg)
{
  if (wxTheApp && wxTheApp->ProcessMessage(msg))
    return TRUE;
  else
    return CWinApp::PreTranslateMessage(msg);
}
```

wxApp::Pending

bool Pending()

Returns TRUE if unprocessed events are in the window system event queue.

See also

wxApp::Dispatch (p. 23)

wxApp::SendIdleEvents

bool SendIdleEvents()

Sends idle events to all top-level windows.

bool SendIdleEvents(wxWindow* *win*)

Sends idle events to a window and its children.

Remarks

These functions poll the top-level windows, and their children, for idle event processing. If TRUE is returned, more OnIdle processing is requested by one or more window.

See also

wxApp::OnIdle (p. 27), *wxWindow::OnIdle* (p. 1217), *wxIdleEvent* (p. 560)

wxApp::SetAppName

void SetAppName(**const wxString&** *name*)

Sets the name of the application. The name may be used in dialogs (for example by the document/view framework). A default name is set by wxWindows.

See also

wxApp::GetAppName (p. 23)

wxApp::SetAuto3D

void SetAuto3D(**const bool** *auto3D*)

Switches automatic 3D controls on or off.

Parameters

auto3D
    If TRUE, all controls will be created with 3D appearances unless overridden for a control or dialog. The default is TRUE

Remarks

This has an effect on Windows only.

See also

wxApp::GetAuto3D (p. 23)

wxApp::SetClassName

void SetClassName(**const wxString&** *name*)

Sets the class name of the application. This may be used in a platform specific manner to refer to the application.

wxApp::SetExitOnFrameDelete

void SetExitOnFrameDelete (**bool** *flag*)

Allows the programmer to specify whether the application will exit when the top-level frame is deleted.

Parameters

flag
If TRUE (the default), the application will exit when the top-level frame is deleted. If FALSE, the application will continue to run.

wxApp::SetTopWindow

void SetTopWindow(**wxWindow*** *window*)

Sets the 'top' window. You can call this from within *wxApp::OnInit* (p. 28) to let wxWindows know which is the main window. You don't have to set the top window; it is only a convenience so that (for example) certain dialogs without parents can use a specific window as the top window. If no top window is specified by the application, wxWindows just uses the first frame or dialog in its top-level window list, when it needs to use the top window.

Parameters

window
The new top window.

See also

wxApp::SetVendorName

void SetVendorName (**const wxString&** *name*)

Sets the name of application's vendor. The name will be used in registry access. A default name is set by wxWindows.

See also

wxApp::GetStdIcon

virtual wxIcon GetStdIcon(**int** *which*) const

Returns the icons used by wxWindows internally, e.g. the ones used for message boxes. This function is used internally and can be overridden by the user to change the default icons.

Parameters

which
> One of the wxICON_XXX specifies which icon to return.

See *wxMessageBox* (p. 1267) for a list of icon identifiers.

wxApp::SetUseBestVisual

void SetUseBestVisual(**bool** *flag*)

Allows the programmer to specify whether the application will use the best visual on systems that support several visual on the same display. This is typically the case under Solaris and IRIX, where the default visual is only 8-bit whereas certain appications are supposed to run in TrueColour mode.

Note that this function has to be called in the constructor of the `wxApp` instance and won't have any effect when called later on.

This function currently only has effect under GTK.

Parameters

flag
> If TRUE, the app will use the best visual.

wxArray

This section describes the so called *dynamic arrays*. This is a C array-like data structure i.e. the member access time is constant (and not linear according to the number of container elements as for linked lists). However, these arrays are dynamic in the sense that they will automatically allocate more memory if there is not enough of it for adding a new element. They also perform range checking on the index values but in debug mode only, so please be sure to compile your application in debug mode to use it (see *debugging overview* (p. 1363) for details). So, unlike the arrays in some other languages, attempt to access an element beyond the arrays bound doesn't automatically

expand the array but provokes an assertion failure instead in debug build and does nothing (except possibly crashing your program) in the release build.

The array classes were designed to be reasonably efficient, both in terms of run-time speed and memory consumption and the executable size. The speed of array item access is, of course, constant (independent of the number of elements) making them much more efficient than linked lists (*wxList* (p. 619)). Adding items to the arrays is also implemented in more or less constant time - but the price is preallocating the memory in advance. In the *memory management* (p. 35) section you may find some useful hints about optimizing wxArray memory usage. As for executable size, all wxArray functions are inline, so they do not take *any space at all.*

wxWindows has three different kinds of array. All of them derive from wxBaseArray class which works with untyped data and can not be used directly. The standard macros WX_DEFINE_ARRAY(), WX_DEFINE_SORTED_ARRAY() and WX_DEFINE_OBJARRAY() are used to define a new class deriving from it. The classes declared will be called in this documentation wxArray, wxSortedArray and wxObjArray but you should keep in mind that no classes with such names actually exist, each time you use one of WX_DEFINE_XXXARRAY macro you define a class with a new name. In fact, these names are "template" names and each usage of one of the macros mentioned above creates a template specialization for the given element type.

wxArray is suitable for storing integer types and pointers which it does not treat as objects in any way, i.e. the element pointed to by the pointer is not deleted when the element is removed from the array. It should be noted that all of wxArray's functions are inline, so it costs strictly nothing to define as many array types as you want (either in terms of the executable size or the speed) as long as at least one of them is defined and this is always the case because wxArrays are used by wxWindows internally. This class has one serious limitation: it can only be used for storing integral types (bool, char, short, int, long and their unsigned variants) or pointers (of any kind). An attempt to use with objects of sizeof() greater than sizeof(long) will provoke a runtime assertion failure, however declaring a wxArray of floats will not (on the machines where sizeof(float) <= sizeof(long)), yet it will **not** work, please use wxObjArray for storing floats and doubles (NB: a more efficient wxArrayDouble class is scheduled for the next release of wxWindows).

wxSortedArray is a wxArray variant which should be used when searching in the array is a frequently used operation. It requires you to define an additional function for comparing two elements of the array element type and always stores its items in the sorted order (according to this function). Thus, it is *Index()* (p. 41) function execution time is $O(\log(N))$ instead of $O(N)$ for the usual arrays but the *Add()* (p. 40) method is slower: it is $O(\log(N))$ instead of constant time (neglecting time spent in memory allocation routine). However, in a usual situation elements are added to an array much less often than searched inside it, so wxSortedArray may lead to huge performance improvements compared to wxArray. Finally, it should be noticed that, as wxArray, wxSortedArray can be only used for storing integral types or pointers.

wxObjArray class treats its elements like "objects". It may delete them when they are removed from the array (invoking the correct destructor) and copies them using the objects copy constructor. In order to implement this behaviour the definition of the wxObjArray arrays is split in two parts: first, you should declare the new wxObjArray

class using WX_DECLARE_OBJARRAY() macro and then you must include the file defining the implementation of template type: <wx/arrimpl.cpp> and define the array class with WX_DEFINE_OBJARRAY() macro from a point where the full (as opposed to 'forward') declaration of the array elements class is in scope. As it probably sounds very complicated here is an example:

```
#include <wx/dynarray.h>

// we must forward declare the array because it is used inside the
class
// declaration
class MyDirectory;
class MyFile;

// this defines two new types: ArrayOfDirectories and ArrayOfFiles
which can be
// now used as shown below
WX_DECLARE_OBJARRAY(MyDirectory, ArrayOfDirectories);
WX_DECLARE_OBJARRAY(MyFile,      ArrayOfFiles);

class MyDirectory
{
...
    ArrayOfDirectories m_subdirectories; // all subdirectories
    ArrayOfFiles       m_files;          // all files in this directory
};

...

// now that we have MyDirectory declaration in scope we may finish the
// definition of ArrayOfDirectories -- note that this expands into some
C++
// code and so should only be compiled once (i.e., don't put this in
the
// header, but into a source file or you will get linkin errors)
#include <wx/arrimpl.cpp> // this is a magic incantation which must be
done!
WX_DEFINE_OBJARRAY(ArrayOfDirectories);

// that's all!
```

It is not as elegant as writing

```
typedef std::vector<MyDirectory> ArrayOfDirectories;
```

but is not that complicated and allows the code to be compiled with any, however dumb, C++ compiler in the world.

Things are much simpler for wxArray and wxSortedArray however: it is enough just to write

```
WX_DEFINE_ARRAY(MyDirectory *, ArrayOfDirectories);
WX_DEFINE_SORTED_ARRAY(MyFile *, ArrayOfFiles);
```

See also:

Include files

<wx/dynarray.h> for wxArray and wxSortedArray and additionally <wx/arrimpl.cpp> for wxObjArray.

Macros for template array definition

To use an array you must first define the array class. This is done with the help of the macros in this section. The class of array elements must be (at least) forward declared for WX_DEFINE_ARRAY, WX_DEFINE_SORTED_ARRAY and WX_DECLARE_OBJARRAY macros and must be fully declared before you use WX_DEFINE_OBJARRAY macro.

Constructors and destructors

Array classes are 100% C++ objects and as such they have the appropriate copy constructors and assignment operators. Copying wxArray just copies the elements but copying wxObjArray copies the arrays items. However, for memory-efficiency sake, neither of these classes has virtual destructor. It is not very important for wxArray which has trivial destructor anyhow, but it does mean that you should avoid deleting wxObjArray through a wxBaseArray pointer (as you would never use wxBaseArray anyhow it shouldn't be a problem) and that you should not derive your own classes from the array classes.

Memory management

Automatic array memory management is quite trivial: the array starts by preallocating some minimal amount of memory (defined by WX_ARRAY_DEFAULT_INITIAL_SIZE) and when further new items exhaust already allocated memory it reallocates it adding 50% of the currently allocated amount, but no more than some maximal number which is defined by ARRAY_MAXSIZE_INCREMENT constant. Of course, this may lead to some

memory being wasted (ARRAY_MAXSIZE_INCREMENT in the worst case, i.e. 4Kb in the current implementation), so the *Shrink()* (p. 43) function is provided to unallocate the extra memory. The *Alloc()* (p. 40) function can also be quite useful if you know in advance how many items you are going to put in the array and will prevent the array code from reallocating the memory more times than needed.

Alloc (p. 40)
Shrink (p. 43)

Number of elements and simple item access

Functions in this section return the total number of array elements and allow to retrieve them - possibly using just the C array indexing [] operator which does exactly the same as *Item()* (p. 42) method.

Count (p. 41)
GetCount (p. 41)
IsEmpty (p. 42)
Item (p. 42)
Last (p. 42)

Adding items

Add (p. 40)
Insert (p. 42)
WX_APPEND_ARRAY (p. 38)

Removing items

WX_CLEAR_ARRAY (p. 39)
Empty (p. 41)
Clear (p. 40)
RemoveAt (p. 43)
Remove (p. 43)

Searching and sorting

Index (p. 41)
Sort (p. 43)

WX_DEFINE_ARRAY

WX_DEFINE_ARRAY (*T*, *name*)

WX_DEFINE_EXPORTED_ARRAY(*T*, *name*)

This macro defines a new array class named *name* and containing the elements of type *T*. The second form is used when compiling DLL under Windows and array needs to be visible outside the DLL. Example:

```
WX_DEFINE_ARRAY(int, wxArrayInt);

class MyClass;
WX_DEFINE_ARRAY(MyClass *, wxArrayOfMyClass);
```

Note that wxWindows predefines the following standard array classes: wxArrayInt, wxArrayLong and wxArrayPtrVoid.

WX_DEFINE_SORTED_ARRAY

WX_DEFINE_SORTED_ARRAY(*T*, *name*)

WX_DEFINE_SORTED_EXPORTED_ARRAY(*T*, *name*)

This macro defines a new sorted array class named *name* and containing the elements of type *T*. The second form is used when compiling DLL under Windows and array needs to be visible outside the DLL.

Example:

```
WX_DEFINE_SORTED_ARRAY(int, wxSortedArrayInt);

class MyClass;
WX_DEFINE_SORTED_ARRAY(MyClass *, wxArrayOfMyClass);
```

You will have to initialize the objects of this class by passing a comparison function to the array object constructor like this:

```
int CompareInts(int n1, int n2)
{
    return n1 - n2;
}

wxSortedArrayInt sorted(CompareInts);

int CompareMyClassObjects(MyClass *item1, MyClass *item2)
{
    // sort the items by their address...
    return Stricmp(item1->GetAddress(), item2->GetAddress());
}

wxArrayOfMyClass another(CompareMyClassObjects);
```

WX_DECLARE_OBJARRAY

WX_DECLARE_OBJARRAY(*T*, *name*)

WX_DECLARE_EXPORTED_OBJARRAY(*T*, *name*)

This macro declares a new object array class named *name* and containing the elements of type *T*. The second form is used when compiling DLL under Windows and array needs to be visible outside the DLL.

Example:

```
class MyClass;
WX_DEFINE_OBJARRAY(MyClass, wxArrayOfMyClass); // note: not "MyClass
*"!
```

You must use *WX_DEFINE_OBJARRAY()* (p. 38) macro to define the array class - otherwise you would get link errors.

WX_DEFINE_OBJARRAY

WX_DEFINE_OBJARRAY(*name*)

This macro defines the methods of the array class *name* not defined by the *WX_DECLARE_OBJARRAY()* (p. 37) macro. You must include the file <wx/arrimpl.cpp> before using this macro and you must have the full declaration of the class of array elements in scope! If you forget to do the first, the error will be caught by the compiler, but, unfortunately, many compilers will not give any warnings if you forget to do the second - but the objects of the class will not be copied correctly and their real destructor will not be called.

Example of usage:

```
// first declare the class!
class MyClass
{
public:
   MyClass(const MyClass&);

   ...

   virtual ~MyClass();
};

#include <wx/arrimpl.cpp>
WX_DEFINE_OBJARRAY(wxArrayOfMyClass);
```

WX_APPEND_ARRAY

void WX_APPEND_ARRAY(**wxArray&** *array*, **wxArray&** *other*)

This macro may be used to append all elements of the *other* array to the *array*. The two arrays must be of the same type.

WX_CLEAR_ARRAY

void WX_CLEAR_ARRAY(**wxArray&** *array*)

This macro may be used to delete all elements of the array before emptying it. It can not be used with wxObjArrays - but they will delete their elements anyhow when you call Empty().

Default constructors

wxArray()

wxObjArray()

Default constructor initializes an empty array object.

wxSortedArray(**int (*)(T first, T second)**_compareFunction_)

There is no default constructor for wxSortedArray classes - you must initialize it with a function to use for item comparison. It is a function which is passed two arguments of type *T* where *T* is the array element type and which should return a negative, zero or positive value according to whether the first element passed to it is less than, equal to or greater than the second one.

wxArray copy constructor and assignment operator

wxArray(**const wxArray&** *array*)

wxSortedArray(**const wxSortedArray&** *array*)

wxObjArray(**const wxObjArray&** *array*)

wxArray& operator=(**const wxArray&** *array*)

wxSortedArray& operator=(**const wxSortedArray&** *array*)

wxObjArray& operator=(**const wxObjArray&** *array*)

The copy constructors and assignment operators perform a shallow array copy (i.e. they don't copy the objects pointed to even if the source array contains the items of pointer type) for wxArray and wxSortedArray and a deep copy (i.e. the array element are copied too) for wxObjArray.

wxArray::~wxArray

~wxArray()

~wxSortedArray()

~wxObjArray()

The wxObjArray destructor deletes all the items owned by the array. This is not done by wxArray and wxSortedArray versions - you may use *WX_CLEAR_ARRAY* (p. 39) macro for this.

wxArray::Add

void Add(**T** *item*)

void Add(**T** ** item*)

void Add(**T** *& item*)

Appends a new element to the array (where *T* is the type of the array elements.)

The first version is used with wxArray and wxSortedArray. The second and the third are used with wxObjArray. There is an important difference between them: if you give a pointer to the array, it will take ownership of it, i.e. will delete it when the item is deleted from the array. If you give a reference to the array, however, the array will make a copy of the item and will not take ownership of the original item. Once again, it only makes sense for wxObjArrays because the other array types never take ownership of their elements.

You may also use *WX_APPEND_ARRAY* (p. 38) macro to append all elements of one array to another one.

wxArray::Alloc

void Alloc(**size_t** *count*)

Preallocates memory for a given number of array elements. It is worth calling when the number of items which are going to be added to the array is known in advance because it will save unneeded memory reallocation. If the array already has enough memory for the given number of items, nothing happens.

wxArray::Clear

void Clear()

This function does the same as *Empty()* (p. 41) and additionally frees the memory

allocated to the array.

wxArray::Count

size_t Count() **const**

Same as *GetCount()* (p. 41). This function is deprecated - it exists only for compatibility.

wxObjArray::Detach

T * Detach(**size_t** *index*)

Removes the element from the array, but, unlike, *Remove()* (p. 43) doesn't delete it. The function returns the pointer to the removed element.

wxArray::Empty

void Empty()

Empties the array. For wxObjArray classes, this destroys all of the array elements. For wxArray and wxSortedArray this does nothing except marking the array of being empty - this function does not free the allocated memory, use *Clear()* (p. 40) for this.

wxArray::GetCount

size_t GetCount() **const**

Return the number of items in the array.

wxArray::Index

int Index(**T&** *item*, **bool** *searchFromEnd = FALSE*)

int Index(**T&** *item*)

The first version of the function is for wxArray and wxObjArray, the second is for wxSortedArray only.

Searches the element in the array, starting from either beginning or the end depending on the value of *searchFromEnd* parameter. wxNOT_FOUND is returned if the element is not found, otherwise the index of the element is returned.

Linear search is used for the wxArray and wxObjArray classes but binary search in the sorted array is used for wxSortedArray (this is why searchFromEnd parameter doesn't make sense for it).

NB: even for wxObjArray classes, the operator==() of the elements in the array is **not** used by this function. It searches exactly the given element in the array and so will only succeed if this element had been previously added to the array, but fail even if another, identical, element is in the array.

wxArray::Insert

void Insert(**T** *item*, **size_t** *n*)

void Insert(**T** **item*, **size_t** *n*)

void Insert(**T &***item*, **size_t** *n*)

Insert a new item into the array before the item *n* - thus, *Insert(something, 0u)* will insert an item in such way that it will become the first array element.

Please see *Add()* (p. 40) for explanation of the differences between the overloaded versions of this function.

wxArray::IsEmpty

bool IsEmpty() **const**

Returns TRUE if the array is empty, FALSE otherwise.

wxArray::Item

T& Item(**size_t** *index*) **const**

Returns the item at the given position in the array. If *index* is out of bounds, an assert failure is raised in the debug builds but nothing special is done in the release build.

The returned value is of type "reference to the array element type" for all of the array classes.

wxArray::Last

T& Last() **const**

Returns the last element in the array, i.e. is the same as Item(GetCount() - 1). An assert failure is raised in the debug mode if the array is empty.

The returned value is of type "reference to the array element type" for all of the array classes.

wxArray::Remove

Remove(**T** *item*)

Removes an element from the array by value: the first item of the array equal to *item* is removed, an assert failure will result from an attempt to remove an item which doesn't exist in the array.

When an element is removed from wxObjArray it is deleted by the array - use *Detach()* (p. 41) if you don't want this to happen. On the other hand, when an object is removed from a wxArray nothing happens - you should delete it manually if required:

```
T *item = array[n];
delete item;
array.Remove(n)
```

See also *WX_CLEAR_ARRAY* (p. 39) macro which deletes all elements of a wxArray (supposed to contain pointers).

wxArray::RemoveAt

RemoveAt(**size_t** *index*)

Removes an element from the array by index. When an element is removed from wxObjArray it is deleted by the array - use *Detach()* (p. 41) if you don't want this to happen. On the other hand, when an object is removed from a wxArray nothing happens - you should delete it manually if required:

```
T *item = array[n];
delete item;
array.RemoveAt(n)
```

See also *WX_CLEAR_ARRAY* (p. 39) macro which deletes all elements of a wxArray (supposed to contain pointers).

wxArray::Shrink

void Shrink()

Frees all memory unused by the array. If the program knows that no new items will be added to the array it may call Shrink() to reduce its memory usage. However, if a new item is added to the array, some extra memory will be allocated again.

wxArray::Sort

void Sort(**CMPFUNC<T>** *compareFunction*)

The notation CMPFUNC<T> should be read as if we had the following declaration:

```
template int CMPFUNC(T *first, T *second);
```

where *T* is the type of the array elements. I.e. it is a function returning *int* which is passed two arguments of type *T **.

Sorts the array using the specified compare function: this function should return a negative, zero or positive value according to whether the first element passed to it is less than, equal to or greater than the second one.

wxSortedArray doesn't have this function because it is always sorted.

wxArrayString

wxArrayString is an efficient container for storing *wxString* (p. 1011) objects. It has the same features as all *wxArray* (p. 32) classes, i.e. it dynamically expands when new items are added to it (so it is as easy to use as a linked list), but the access time to the elements is constant, instead of being linear in number of elements as in the case of linked lists. It is also very size efficient and doesn't take more space than a C array *wxString[]* type (wxArrayString uses its knowledge of internals of wxString class to achieve this).

This class is used in the same way as other dynamic *arrays* (p. 32), except that no *WX_DEFINE_ARRAY* declaration is needed for it. When a string is added or inserted in the array, a copy of the string is created, so the original string may be safely deleted (e.g. if it was a *char ** pointer the memory it was using can be freed immediately after this). In general, there is no need to worry about string memory deallocation when using this class - it will always free the memory it uses itself.

The references returned by *Item* (p. 48), *Last* (p. 48) or *operator[]* (p. 46) are not constant, so the array elements may be modified in place like this

```
array.Last().MakeUpper();
```

There is also a varian of wxArrayString called wxSortedArrayString which has exactly the same methods as wxArrayString, but which always keeps the string in it in (alphabetical) order. wxSortedArrayString uses binary search in its *Index* (p. 47) function (insteadf of linear search for wxArrayString::Index) which makes it much more efficient if you add strings to the array rarely (because, of course, you have to pay for Index() efficiency by having Add() be slower) but search for them often. Several methods should not be used with sorted array (basicly, all which break the order of items) which is mentioned in their description.

Final word: none of the methods of wxArrayString is virtual including its destructor, so this class should not be used as a base class.

Derived from

Although this is not true strictly speaking, this class may be considered as a specialization of *wxArray* (p. 32) class for the wxString member data: it is not implemented like this, but it does have all of the wxArray functions.

Include files

<wx/string.h>

See also

wxArray (p. 32), *wxString* (p. 1011), *wxString overview* (p. 1339)

wxArrayString::wxArrayString

wxArrayString()

wxArrayString(**const wxArrayString&** *array*)

Default and copy constructors.

Note that when an array is assigned to a sorted array, its contents is automatically sorted during construction.

wxArrayString::~wxArrayString

~wxArrayString()

Destructor frees memory occupied by the array strings. For the performance reasons it is not virtual, so this class should not be derived from.

wxArrayString::operator=

wxArrayString & operator =(**const wxArrayString&** *array*)

Assignment operator.

wxArrayString::operator==

bool operator ==(**const wxArrayString&** *array*) **const**

Compares 2 arrays respecting the case. Returns TRUE only if the arrays have the same number of elements and the same strings in the same order.

wxArrayString::operator!=

bool operator !=(**const wxArrayString&** *array*) **const**

Compares 2 arrays respecting the case. Returns TRUE if the arrays have different number of elements or if the elements don't match pairwise.

wxArrayString::operator[]

wxString& operator[](**size_t** *nIndex*)

Return the array element at position *nIndex*. An assert failure will result from an attempt to access an element beyond the end of array in debug mode, but no check is done in release mode.

This is the operator version of *Item* (p. 48) method.

wxArrayString::Add

size_t Add(**const wxString&** *str*)

Appends a new item to the array and return the index of th new item in the array.

Warning: For sorted arrays, the index of the inserted item will not be, in general, equal to *GetCount()* (p. 47) - 1 because the item is inserted at the correct position to keep the array sorted and not appended.

See also: *Insert* (p. 47)

wxArrayString::Alloc

void Alloc(**size_t** *nCount*)

Preallocates enough memory to store *nCount* items. This function may be used to improve array class performance before adding a known number of items consecutively.

See also: *Dynamic array memory management* (p. 35)

wxArrayString::Clear

void Clear()

Clears the array contents and frees memory.

See also: *Empty* (p. 47)

wxArrayString::Count

size_t Count() **const**

Returns the number of items in the array. This function is deprecated and is for backwards compatibility only, please use *GetCount* (p. 47) instead.

wxArrayString::Empty

void Empty()

Empties the array: after a call to this function *GetCount* (p. 47) will return 0. However, this function does not free the memory used by the array and so should be used when the array is going to be reused for storing other strings. Otherwise, you should use *Clear* (p. 46) to empty the array and free memory.

wxArrayString::GetCount

size_t GetCount() **const**

Returns the number of items in the array.

wxArrayString::Index

int Index(**const char** * *sz*, **bool** *bCase = TRUE*, **bool** *bFromEnd = FALSE*)

Search the element in the array, starting from the beginning if *bFromEnd* is FALSE or from end otherwise. If *bCase*, comparison is case sensitive (default), otherwise the case is ignored.

This function uses linear search for wxArrayString and binary search for wxSortedArrayString, but it ignores the *bCase* and *bFromEnd* parameters in the latter case.

Returns index of the first item matched or wxNOT_FOUND if there is no match.

wxArrayString::Insert

void Insert(**const wxString&** *str*, **size_t** *nIndex*)

Insert a new element in the array before the position *nIndex*. Thus, for example, to insert the string in the beginning of the array you would write

```
Insert("foo", 0);
```

If *nIndex* is equal to *GetCount() + 1* this function behaves as *Add* (p. 46).

Warning: this function should not be used with sorted arrays because it could break the order of items and, for example, subsequent calls to *Index()* (p. 47) would then not work!

wxArrayString::IsEmpty

IsEmpty()

Returns TRUE if the array is empty, FALSE otherwise. This function returns the same result as *GetCount() == 0* but is probably easier to read.

wxArrayString::Item

wxString& Item(**size_t** *nIndex*) **const**

Return the array element at position *nIndex*. An assert failure will result from an attempt to access an element beyond the end of array in debug mode, but no check is done in release mode.

See also *operator[]* (p. 46) for the operator version.

wxArrayString::Last

Last()

Returns the last element of the array. Attempt to access the last element of an empty array will result in assert failure in debug build, however no checks are done in release mode.

wxArrayString::Remove

void Remove(**const char *** *sz*)

Removes the first item matching this value. An assert failure is provoked by an attempt to remove an element which does not exist in debug build.

See also: *Index* (p. 47)

void Remove(**size_t** *nIndex*)

Removes the item at given position.

wxArrayString::Shrink

void Shrink()

Releases the extra memory allocated by the array. This function is useful to minimize the array memory consumption.

See also: *Alloc* (p. 46), *Dynamic array memory management* (p. 35)

wxArrayString::Sort

void Sort(**bool** *reverseOrder = FALSE*)

Sorts the array in alphabetical order or in reverse alphabetical order if *reverseOrder* is TRUE.

Warning: this function should not be used with sorted array because it could break the order of items and, for example, subsequent calls to *Index()* (p. 47) would then not work!

void Sort(**CompareFunction** *compareFunction*)

Sorts the array using the specified *compareFunction* for item comparison.*CompareFunction* is defined as a function taking two *const wxString&* parameters and returning an *int* value less than, equal to or greater than 0 if the first string is less than, equal to or greater than the second one.

Example

The following example sorts strings by their length.

```
static int CompareStringLen(const wxString& first, const wxString&
second)
{
    return first.length() - second.length();
}

...

wxArrayString array;

array.Add("one");
array.Add("two");
array.Add("three");
array.Add("four");

array.Sort(CompareStringLen);
```

Warning: this function should not be used with sorted array because it could break the order of items and, for example, subsequent calls to *Index()* (p. 47) would then not work!

wxAutomationObject

The **wxAutomationObject** class represents an OLE automation object containing a single data member, an IDispatch pointer. It contains a number of functions that make it easy to perform automation operations, and set and get properties. The class makes heavy use of the *wxVariant* (p. 1174) class.

The usage of these classes is quite close to OLE automation usage in Visual Basic. The API is high-level, and the application can specify multiple properties in a single string. The following example gets the current Excel instance, and if it exists, makes the active cell bold.

```
wxAutomationObject excelObject;
if (excelObject.GetInstance("Excel.Application"))
    excelObject.PutProperty("ActiveCell.Font.Bold", TRUE);
```

Note that this class works under Windows only, and currently only for Visual C++.

Derived from

wxObject (p. 750)

Include files

<wx/msw/ole/automtn.h>

See also

wxVariant (p. 1174)

wxAutomationObject::wxAutomationObject

wxAutomationObject(**WXIDISPATCH*** *dispatchPtr = NULL*)

Constructor, taking an optional IDispatch pointer which will be released when the object is deleted.

wxAutomationObject::~wxAutomationObject

~wxAutomationObject()

Destructor. If the internal IDispatch pointer is non-null, it will be released.

wxAutomationObject::CallMethod

wxVariant CallMethod(**const wxString&** *method*, **int** *noArgs*, **wxVariant** *args[]*) **const**

wxVariant CallMethod(**const wxString&** *method*, **...**) **const**

Calls an automation method for this object. The first form takes a method name, number of arguments, and an array of variants. The second form takes a method name and zero to six constant references to variants. Since the variant class has constructors for the basic data types, and C++ provides temporary objects automatically, both of the following lines are syntactically valid:

```
  wxVariant res = obj.CallMethod("Sum", wxVariant(1.2),
wxVariant(3.4));
  wxVariant res = obj.CallMethod("Sum", 1.2, 3.4);
```

Note that *method* can contain dot-separated property names, to save the application needing to call GetProperty several times using several temporary objects. For example:

```
  object.CallMethod("ActiveCell.Font.ShowDialog", "My caption");
```

wxAutomationObject::CreateInstance

bool CreateInstance(**const wxString&** *classId*) **const**

Creates a new object based on the class id, returning TRUE if the object was successfully created, or FALSE if not.

wxAutomationObject::GetDispatchPtr

IDispatch* GetDispatchPtr() **const**

Gets the IDispatch pointer.

wxAutomationObject::GetInstance

bool GetInstance(**const wxString&** *classId*) **const**

Retrieves the current object associated with a class id, and attaches the IDispatch pointer to this object. Returns TRUE if a pointer was succesfully retrieved, FALSE

otherwise.

Note that this cannot cope with two instances of a given OLE object being active simultaneously, such as two copies of Excel running. Which object is referenced cannot currently be specified.

wxAutomationObject::GetObject

bool GetObject(**wxAutomationObject&***obj* **const wxString&** *property*, **int** *noArgs = 0*, **wxVariant** *args[] = NULL*) **const**

Retrieves a property from this object, assumed to be a dispatch pointer, and initialises *obj* with it. To avoid having to deal with IDispatch pointers directly, use this function in preference to *wxAutomationObject::GetProperty* (p. 52) when retrieving objects from other objects.

Note that an IDispatch pointer is stored as a void* pointer in wxVariant objects.

See also

wxAutomationObject::GetProperty (p. 52)

wxAutomationObject::GetProperty

wxVariant GetProperty(**const wxString&** *property*, **int** *noArgs*, **wxVariant** *args[]*) **const**

wxVariant GetProperty(**const wxString&** *property*, **...**) **const**

Gets a property value from this object. The first form takes a property name, number of arguments, and an array of variants. The second form takes a property name and zero to six constant references to variants. Since the variant class has constructors for the basic data types, and C++ provides temporary objects automatically, both of the following lines are syntactically valid:

```
wxVariant res = obj.GetProperty("Range", wxVariant("A1"));
wxVariant res = obj.GetProperty("Range", "A1");
```

Note that *property* can contain dot-separated property names, to save the application needing to call GetProperty several times using several temporary objects.

wxAutomationObject::Invoke

bool Invoke(**const wxString&** *member*, **int** *action*, **wxVariant&** *retValue*, **int** *noArgs*, **wxVariant** *args[]*, **const wxVariant*** *ptrArgs[] = 0*) **const**

This function is a low-level implementation that allows access to the IDispatch Invoke function. It is not meant to be called directly by the application, but is used by other convenience functions.

Parameters

member
> The member function or property name.

action
> Bitlist: may contain DISPATCH_PROPERTYPUT, DISPATCH_PROPERTYPUTREF, DISPATCH_METHOD.

retValue
> Return value (ignored if there is no return value)
.

noArgs
> Number of arguments in *args* or *ptrArgs*.

args
> If non-null, contains an array of variants.

ptrArgs
> If non-null, contains an array of constant pointers to variants.

Return value

TRUE if the operation was successful, FALSE otherwise.

Remarks

Two types of argument array are provided, so that when possible pointers are used for efficiency.

wxAutomationObject::PutProperty

bool PutProperty(**const wxString&** *property*, **int** *noArgs*, **wxVariant** *args[]*) **const**

bool PutProperty(**const wxString&** *property*, **...**)

Puts a property value into this object. The first form takes a property name, number of arguments, and an array of variants. The second form takes a property name and zero to six constant references to variants. Since the variant class has constructors for the basic data types, and C++ provides temporary objects automatically, both of the following lines are syntactically valid:

```
obj.PutProperty("Value", wxVariant(23));
```

```
obj.PutProperty("Value", 23);
```

Note that *property* can contain dot-separated property names, to save the application needing to call GetProperty several times using several temporary objects.

wxAutomationObject::SetDispatchPtr

void SetDispatchPtr(**WXIDISPATCH*** *dispatchPtr*)

Sets the IDispatch pointer. This function does not check if there is already an IDispatch pointer.

You may need to cast from IDispatch* to WXIDISPATCH* when calling this function.

wxBitmap

This class encapsulates the concept of a platform-dependent bitmap, either monochrome or colour.

Derived from

wxGDIObject(p. 477)
wxObject(p. 750)

Include files

<wx/bitmap.h>

Predefined objects

Objects:

wxNullBitmap

See also

wxBitmap overview(p. 1397),*supported bitmap file formats* (p. 1398),*wxDC::Blit* (p. 283),*wxIcon* (p. 562), *wxCursor* (p. 184), *wxBitmap* (p. 54),*wxMemoryDC* (p. 682)

wxBitmap::wxBitmap

wxBitmap()

Default constructor.

wxBitmap(**const wxBitmap&** *bitmap*)

Copy constructor.

wxBitmap(**void*** *data*, **int** *type*, **int** *width*, **int** *height*, **int** *depth = -1*)

Creates a bitmap from the given data which is interpreted in platform-dependent manner.

wxBitmap(**const char** *bits[]*, **int** *width*, **int** *height*
 int *depth = 1*)

Creates a bitmap from an array of bits.

You should only use this function for monochrome bitmaps (*depth* 1) in portable programs: in this case the *bits* parameter should contain an XBM image.

For other bit depths, the behaviour is platform dependent: under Windows, the data is passed without any changes to the underlying CreateBitmap() API. Under other platforms, only monochrome bitmaps may be created using this constructor and *wxImage* (p. 569) should be used for creating colour bitmaps from static data.

wxBitmap(**int** *width*, **int** *height*, **int** *depth = -1*)

Creates a new bitmap. A depth of -1 indicates the depth of the current screen or visual. Some platforms only support 1 for monochrome and -1 for the current colour setting.

wxBitmap(**const char**** *bits*)

Creates a bitmap from XPM data.

wxBitmap(**const wxString&** *name*, **long** *type*)

Loads a bitmap from a file or resource.

Parameters

bits
      Specifies an array of pixel values.

width
      Specifies the width of the bitmap.

height
      Specifies the height of the bitmap.

depth

Specifies the depth of the bitmap. If this is omitted, the display depth of the screen is used.

name

This can refer to a resource name under MS Windows, or a filename under MS Windows and X. Its meaning is determined by the *type* parameter.

type

May be one of the following:

wxBITMAP_TYPE_BMP   Load a Windows bitmap file.

wxBITMAP_TYPE_BMP_RESOURCE   Load a Windows bitmap from the resource database.

wxBITMAP_TYPE_GIF   Load a GIF bitmap file.

wxBITMAP_TYPE_XBM   Load an X bitmap file.

wxBITMAP_TYPE_XPM   Load an XPM bitmap file.

wxBITMAP_TYPE_RESOURCE   Load a Windows resource name.

The validity of these flags depends on the platform and wxWindows configuration. If all possible wxWindows settings are used, the Windows platform supports BMP file, BMP resource, XPM data, and XPM. Under wxGTK, the available formats are BMP file, XPM data, XPM file, and PNG file. Under wxMotif, the available formats are XBM data, XBM file, XPM data, XPM file.

In addition, wxBitmap can read all formats that *wxImage* (p. 569) can, which currently include wxBITMAP_TYPE_JPEG, wxBITMAP_TYPE_TIF, wxBITMAP_TYPE_PNG, wxBITMAP_TYPE_GIF, wxBITMAP_TYPE_PCX, and wxBITMAP_TYPE_PNM. Of course, you must have wxImage handlers loaded.

Remarks

The first form constructs a bitmap object with no data; an assignment or another member function such as Create or LoadFile must be called subsequently.

The second and third forms provide copy constructors. Note that these do not copy the bitmap data, but instead a pointer to the data, keeping a reference count. They are therefore very efficient operations.

The fourth form constructs a bitmap from data whose type and value depends on the value of the *type* argument.

The fifth form constructs a (usually monochrome) bitmap from an array of pixel values, under both X and Windows.

The sixth form constructs a new bitmap.

The seventh form constructs a bitmap from pixmap (XPM) data, if wxWindows has been configured to incorporate this feature.

To use this constructor, you must first include an XPM file. For example, assuming that the file `mybitmap.xpm` contains an XPM array of character pointers called mybitmap:

```
#include "mybitmap.xpm"

...

wxBitmap *bitmap = new wxBitmap(mybitmap);
```

The eighth form constructs a bitmap from a file or resource. *name* can refer to a resource name under MS Windows, or a filename under MS Windows and X.

Under Windows, *type* defaults to wxBITMAP_TYPE_BMP_RESOURCE. Under X, *type* defaults to wxBITMAP_TYPE_XPM.

See also

wxBitmap::LoadFile (p. 61)

wxPython note: Constructors supported by wxPython are:

> **wxBitmap(name, flag)**   Loads a bitmap from a file
>
> **wxBitmapFromData(data, type, width, height, depth=1)**   Creates a bitmap from the given data, which can be of arbitrary type.
>
> **wxNoRefBitmap(name, flag)**   This one won't own the reference, so Python won't call the destructor, this is good for toolbars and such where the parent will manage the bitmap.
>
> **wxEmptyBitmap(width, height, depth = -1)**   Creates an empty bitmap with the given specifications

wxBitmap::~wxBitmap

 ~wxBitmap()

Destroys the wxBitmap object and possibly the underlying bitmap data. Because reference counting is used, the bitmap may not actually be destroyed at this point - only when the reference count is zero will the data be deleted.

If the application omits to delete the bitmap explicitly, the bitmap will be destroyed automatically by wxWindows when the application exits.

Do not delete a bitmap that is selected into a memory device context.

wxBitmap::AddHandler

static void AddHandler(**wxBitmapHandler*** *handler*)

Adds a handler to the end of the static list of format handlers.

handler
>   A new bitmap format handler object. There is usually only one instance of a given handler class in an application session.

See also

wxBitmapHandler (p. 66)

wxBitmap::CleanUpHandlers

static void CleanUpHandlers()

Deletes all bitmap handlers.

This function is called by wxWindows on exit.

wxBitmap::Create

virtual bool Create(**int** *width*, **int** *height*, **int** *depth = -1*)

Creates a fresh bitmap. If the final argument is omitted, the display depth of the screen is used.

virtual bool Create(**void*** *data*, **int** *type*, **int** *width*, **int** *height*, **int** *depth = -1*)

Creates a bitmap from the given data, which can be of arbitrary type.

Parameters

width
>   The width of the bitmap in pixels.

height
>   The height of the bitmap in pixels.

depth
>   The depth of the bitmap in pixels. If this is -1, the screen depth is used.

data

Data whose type depends on the value of *type.*

type
A bitmap type identifier - see *wxBitmap::wxBitmap* (p. 54) for a list of possible values.

Return value

TRUE if the call succeeded, FALSE otherwise.

Remarks

The first form works on all platforms. The portability of the second form depends on the type of data.

See also

wxBitmap::wxBitmap (p. 54)

wxBitmap::FindHandler

static wxBitmapHandler* FindHandler(**const wxString&** *name*)

Finds the handler with the given name.

static wxBitmapHandler* FindHandler(**const wxString&** *extension*, **long** *bitmapType*)

Finds the handler associated with the given extension and type.

static wxBitmapHandler* FindHandler(**long** *bitmapType*)

Finds the handler associated with the given bitmap type.

name
The handler name.

extension
The file extension, such as "bmp".

bitmapType
The bitmap type, such as wxBITMAP_TYPE_BMP.

Return value

A pointer to the handler if found, NULL otherwise.

See also

wxBitmapHandler (p. 66)

wxBitmap::GetDepth

int GetDepth() const

Gets the colour depth of the bitmap. A value of 1 indicates a monochrome bitmap.

wxBitmap::GetHandlers

static wxList& GetHandlers()

Returns the static list of bitmap format handlers.

See also

wxBitmapHandler (p. 66)

wxBitmap::GetHeight

int GetHeight() const

Gets the height of the bitmap in pixels.

wxBitmap::GetPalette

wxPalette* GetPalette() const

Gets the associated palette (if any) which may have been loaded from a file or set for the bitmap.

See also

wxPalette (p. 765)

wxBitmap::GetMask

wxMask* GetMask() const

Gets the associated mask (if any) which may have been loaded from a file or set for the bitmap.

See also

wxBitmap::SetMask (p. 64), *wxMask* (p. 663)

wxBitmap::GetWidth

int GetWidth() const

Gets the width of the bitmap in pixels.

See also

wxBitmap::GetHeight (p. 60)

wxBitmap::GetSubBitmap

wxBitmap GetSubBitmap(const wxRect&*rect*) const

Returns a sub bitmap of the current one as long as the rect belongs entirely to the bitmap. This function preserves bit depth and mask information.

wxBitmap::InitStandardHandlers

static void InitStandardHandlers()

Adds the standard bitmap format handlers, which, depending on wxWindows configuration, can be handlers for Windows bitmap, Windows bitmap resource, and XPM.

This function is called by wxWindows on startup.

See also

wxBitmapHandler (p. 66)

wxBitmap::InsertHandler

static void InsertHandler(wxBitmapHandler* *handler*)

Adds a handler at the start of the static list of format handlers.

handler
> A new bitmap format handler object. There is usually only one instance of a given handler class in an application session.

See also

wxBitmapHandler (p. 66)

wxBitmap::LoadFile

bool LoadFile(**const wxString&** *name*, **long** *type*)

Loads a bitmap from a file or resource.

Parameters

name
> Either a filename or a Windows resource name. The meaning of *name* is determined by the *type* parameter.

type
> One of the following values:

> **wxBITMAP_TYPE_BMP** Load a Windows bitmap file.

> **wxBITMAP_TYPE_BMP_RESOURCE** Load a Windows bitmap from the resource database.

> **wxBITMAP_TYPE_GIF** Load a GIF bitmap file.

> **wxBITMAP_TYPE_XBM** Load an X bitmap file.

> **wxBITMAP_TYPE_XPM** Load an XPM bitmap file.

> The validity of these flags depends on the platform and wxWindows configuration.

> In addition, wxBitmap can read all formats that *wxImage* (p. 569) can (wxBITMAP_TYPE_JPEG, wxBITMAP_TYPE_PNG, wxBITMAP_TYPE_GIF, wxBITMAP_TYPE_PCX, wxBITMAP_TYPE_PNM). (Of course you must have wxImage handlers loaded.)

Return value

TRUE if the operation succeeded, FALSE otherwise.

Remarks

A palette may be associated with the bitmap if one exists (especially for colour Windows bitmaps), and if the code supports it. You can check if one has been created by using the *GetPalette* (p. 60) member.

See also

wxBitmap::SaveFile (p. 63)

wxBitmap::Ok

bool Ok() **const**

Returns TRUE if bitmap data is present.

wxBitmap::RemoveHandler

static bool RemoveHandler(**const wxString&** *name*)

Finds the handler with the given name, and removes it. The handler is not deleted.

name
    The handler name.

Return value

TRUE if the handler was found and removed, FALSE otherwise.

See also

wxBitmapHandler (p. 66)

wxBitmap::SaveFile

bool SaveFile(**const wxString&** *name*, **int** *type*, **wxPalette*** *palette = NULL*)

Saves a bitmap in the named file.

Parameters

name
    A filename. The meaning of *name* is determined by the *type* parameter.

type
    One of the following values:

    wxBITMAP_TYPE_BMP   Save a Windows bitmap file.

    wxBITMAP_TYPE_GIF   Save a GIF bitmap file.

    wxBITMAP_TYPE_XBM   Save an X bitmap file.

    wxBITMAP_TYPE_XPM   Save an XPM bitmap file.

    The validity of these flags depends on the platform and wxWindows configuration.

    In addition, wxBitmap can save all formats that *wxImage* (p. 569) can (wxBITMAP_TYPE_JPEG, wxBITMAP_TYPE_PNG). (Of course you must have wxImage handlers loaded.)

palette

An optional palette used for saving the bitmap.

Return value

TRUE if the operation succeeded, FALSE otherwise.

Remarks

Depending on how wxWindows has been configured, not all formats may be available.

See also

wxBitmap::LoadFile (p. 61)

wxBitmap::SetDepth

void SetDepth(**int** *depth*)

Sets the depth member (does not affect the bitmap data).

Parameters

depth
    Bitmap depth.

wxBitmap::SetHeight

void SetHeight(**int** *height*)

Sets the height member (does not affect the bitmap data).

Parameters

height
    Bitmap height in pixels.

wxBitmap::SetMask

void SetMask(**wxMask*** *mask*)

Sets the mask for this bitmap.

Remarks

The bitmap object owns the mask once this has been called.

See also

wxBitmap::GetMask (p. 60), *wxMask* (p. 663)

wxBitmap::SetOk

void SetOk(**int** *isOk*)

Sets the validity member (does not affect the bitmap data).

Parameters

isOk
 Validity flag.

wxBitmap::SetPalette

void SetPalette (**const wxPalette&** *palette*)

Sets the associated palette.

Parameters

palette
 The palette to set.

See also

wxPalette (p. 765)

wxBitmap::SetWidth

void SetWidth(**int** *width*)

Sets the width member (does not affect the bitmap data).

Parameters

width
 Bitmap width in pixels.

wxBitmap::operator =

wxBitmap& operator =(**const wxBitmap&** *bitmap*)

Assignment operator. This operator does not copy any data, but instead passes a
pointer to the data in *bitmap* and increments a reference counter. It is a fast operation.

Parameters

bitmap
     Bitmap to assign.

Return value

Returns 'this' object.

wxBitmap::operator ==

bool operator ==(**const wxBitmap&** *bitmap*)

Equality operator. This operator tests whether the internal data pointers are equal (a fast test).

Parameters

bitmap
     Bitmap to compare with 'this'

Return value

Returns TRUE if the bitmaps were effectively equal, FALSE otherwise.

wxBitmap::operator !=

bool operator !=(**const wxBitmap&** *bitmap*)

Inequality operator. This operator tests whether the internal data pointers are unequal (a fast test).

Parameters

bitmap
     Bitmap to compare with 'this'

Return value

Returns TRUE if the bitmaps were unequal, FALSE otherwise.

wxBitmapHandler

Overview (p. 1397)

This is the base class for implementing bitmap file loading/saving, and bitmap creation from data. It is used within wxBitmap and is not normally seen by the application.

If you wish to extend the capabilities of wxBitmap, derive a class from wxBitmapHandler and add the handler using *wxBitmap::AddHandler* (p. 58) in your application initialisation.

Derived from

wxObject (p. 750)

Include files

<wx/bitmap.h>

See also

wxBitmap (p. 54), *wxIcon* (p. 562), *wxCursor* (p. 184)

wxBitmapHandler::wxBitmapHandler

wxBitmapHandler()

Default constructor. In your own default constructor, initialise the members m_name, m_extension and m_type.

wxBitmapHandler::~wxBitmapHandler

~wxBitmapHandler()

Destroys the wxBitmapHandler object.

wxBitmapHandler::Create

virtual bool Create(**wxBitmap*** *bitmap*, **void*** *data*, **int** *type*, **int** *width*, **int** *height*, **int** *depth = -1*)

Creates a bitmap from the given data, which can be of arbitrary type. The wxBitmap object *bitmap* is manipulated by this function.

Parameters

bitmap
    The wxBitmap object.

width

The width of the bitmap in pixels.

height
 The height of the bitmap in pixels.

depth
 The depth of the bitmap in pixels. If this is -1, the screen depth is used.

data
 Data whose type depends on the value of *type*.

type
 A bitmap type identifier - see *wxBitmapHandler::wxBitmapHandler* (p. 54) for a list of possible values.

Return value

TRUE if the call succeeded, FALSE otherwise (the default).

wxBitmapHandler::GetName

wxString GetName() **const**

Gets the name of this handler.

wxBitmapHandler::GetExtension

wxString GetExtension() **const**

Gets the file extension associated with this handler.

wxBitmapHandler::GetType

long GetType() **const**

Gets the bitmap type associated with this handler.

wxBitmapHandler::LoadFile

bool LoadFile(**wxBitmap*** *bitmap*, **const wxString&** *name*, **long** *type*)

Loads a bitmap from a file or resource, putting the resulting data into *bitmap*.

Parameters

bitmap

The bitmap object which is to be affected by this operation.

name
>Either a filename or a Windows resource name. The meaning of *name* is determined by the *type* parameter.

type
>See *wxBitmap::wxBitmap* (p. 54) for values this can take.

Return value

TRUE if the operation succeeded, FALSE otherwise.

See also

wxBitmap::LoadFile (p. 61)
wxBitmap::SaveFile (p. 63)
wxBitmapHandler::SaveFile (p. 69)

wxBitmapHandler::SaveFile

bool SaveFile(**wxBitmap*** *bitmap*, **const wxString&** *name*, **int** *type*, **wxPalette*** *palette* = *NULL*)

Saves a bitmap in the named file.

Parameters

bitmap
>The bitmap object which is to be affected by this operation.

name
>A filename. The meaning of *name* is determined by the *type* parameter.

type
>See *wxBitmap::wxBitmap* (p. 54) for values this can take.

palette
>An optional palette used for saving the bitmap.

Return value

TRUE if the operation succeeded, FALSE otherwise.

See also

wxBitmap::LoadFile (p. 61)
wxBitmap::SaveFile (p. 63)
wxBitmapHandler::LoadFile (p. 68)

wxBitmapHandler::SetName

void SetName(**const wxString&** *name*)

Sets the handler name.

Parameters

name
    Handler name.

wxBitmapHandler::SetExtension

void SetExtension(**const wxString&** *extension*)

Sets the handler extension.

Parameters

extension
    Handler extension.

wxBitmapHandler::SetType

void SetType(**long** *type*)

Sets the handler type.

Parameters

name
    Handler type.

wxBitmapButton

A bitmap button is a control that contains a bitmap. It may be placed on a *dialog box* (p. 312) or *panel* (p. 769), or indeed almost any other window.

Derived from

wxButton (p. 89)
wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)

wxObject (p. 750)

Include files

<wx/bmpbuttn.h>

Remarks

A bitmap button can be supplied with a single bitmap, and wxWindows will draw all button states using this bitmap. If the application needs more control, additional bitmaps for the selected state, unpressed focused state, and greyed-out state may be supplied.

Window styles

wxBU_AUTODRAW	If this is specified, the button will be drawn automatically using the label bitmap only, providing a 3D-look border. If this style is not specified, the button will be drawn without borders and using all provided bitmaps. WIN32 only.
wxBU_LEFT	Left-justifies the bitmap label. WIN32 only.
wxBU_TOP	Aligns the bitmap label to the top of the button. WIN32 only.
wxBU_RIGHT	Right-justifies the bitmap label. WIN32 only.
wxBU_BOTTOM	Aligns the bitmap label to the bottom of the button. WIN32 only.

See also *window styles overview* (p. 1379).

Event handling

EVT_BUTTON(id, func)	Process a wxEVT_COMMAND_BUTTON_CLICKED event, when the button is clicked.

See also

wxButton (p. 89)

wxBitmapButton::wxBitmapButton

wxBitmapButton()

Default constructor.

wxBitmapButton(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxBitmap&** *bitmap*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxBU_AUTODRAW*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const**

wxString& *name = "button"*)

Constructor, creating and showing a button.

Parameters

parent
   Parent window. Must not be NULL.

id
   Button identifier. A value of -1 indicates a default value.

bitmap
   Bitmap to be displayed.

pos
   Button position.

size
   Button size. If the default size (-1, -1) is specified then the button is sized appropriately for the bitmap.

style
   Window style. See *wxBitmapButton* (p. 70).

validator
   Window validator.

name
   Window name.

Remarks

The *bitmap* parameter is normally the only bitmap you need to provide, and wxWindows will draw the button correctly in its different states. If you want more control, call any of the functions *wxBitmapButton::SetBitmapSelected* (p. 75), *wxBitmapButton::SetBitmapFocus* (p. 74), *wxBitmapButton::SetBitmapDisabled* (p. 74).

Note that the bitmap passed is smaller than the actual button created.

See also

wxBitmapButton::Create (p. 73), *wxValidator* (p. 1172)

wxBitmapButton::~wxBitmapButton

~wxBitmapButton()

Destructor, destroying the button.

wxBitmapButton::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxBitmap&** *bitmap*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxValidator&** *validator*, **const wxString&** *name = "button"*)

Button creation function for two-step creation. For more details, see *wxBitmapButton::wxBitmapButton* (p. 71).

wxBitmapButton::GetBitmapDisabled

wxBitmap& GetBitmapDisabled() **const**

Returns the bitmap for the disabled state.

Return value

A reference to the disabled state bitmap.

See also

wxBitmapButton::SetBitmapDisabled (p. 74)

wxBitmapButton::GetBitmapFocus

wxBitmap& GetBitmapFocus() **const**

Returns the bitmap for the focused state.

Return value

A reference to the focused state bitmap.

See also

wxBitmapButton::SetBitmapFocus (p. 74)

wxBitmapButton::GetBitmapLabel

wxBitmap& GetBitmapLabel() **const**

Returns the label bitmap (the one passed to the constructor).

Return value

A reference to the button's label bitmap.

See also

wxBitmapButton::SetBitmapLabel (p. 75)

wxBitmapButton::GetBitmapSelected

wxBitmap& GetBitmapSelected() **const**

Returns the bitmap for the selected state.

Return value

A reference to the selected state bitmap.

See also

wxBitmapButton::SetBitmapSelected (p. 75)

wxBitmapButton::SetBitmapDisabled

void SetBitmapDisabled(**const wxBitmap&** *bitmap*)

Sets the bitmap for the disabled button appearance.

Parameters

bitmap
    The bitmap to set.

See also

wxBitmapButton::GetBitmapDisabled (p. 73), *wxBitmapButton::SetBitmapLabel* (p. 75), *wxBitmapButton::SetBitmapSelected* (p. 75), *wxBitmapButton::SetBitmapFocus* (p. 74)

wxBitmapButton::SetBitmapFocus

void SetBitmapFocus(**const wxBitmap&** *bitmap*)

Sets the bitmap for the button appearance when it has the keyboard focus.

Parameters

bitmap
    The bitmap to set.

See also

wxBitmapButton::GetBitmapFocus (p. 73), *wxBitmapButton::SetBitmapLabel* (p. 75), *wxBitmapButton::SetBitmapSelected* (p. 75), *wxBitmapButton::SetBitmapDisabled* (p. 74)

wxBitmapButton::SetBitmapLabel

void SetBitmapLabel(**const wxBitmap&** *bitmap*)

Sets the bitmap label for the button.

Parameters

bitmap
    The bitmap label to set.

Remarks

This is the bitmap used for the unselected state, and for all other states if no other bitmaps are provided.

See also

wxBitmapButton::GetBitmapLabel (p. 73)

wxBitmapButton::SetBitmapSelected

void SetBitmapSelected(**const wxBitmap&** *bitmap*)

Sets the bitmap for the selected (depressed) button appearance.

Parameters

bitmap
    The bitmap to set.

See also

wxBitmapButton::GetBitmapSelected (p. 74), *wxBitmapButton::SetBitmapLabel* (p. 75), *wxBitmapButton::SetBitmapFocus* (p. 74), *wxBitmapButton::SetBitmapDisabled* (p. 74)

wxBitmapDataObject

wxBitmapDataObject is a specialization of wxDataObject for bitmap data. It can be used without change to paste data into the *wxClipboard* (p. 121) or a *wxDropSource* (p. 368).

A user may wish to derive a new class from this class for providing a bitmap on-demand in order to minimize memory consumption when offering data in several formats, such as a bitmap and GIF.

wxPython note: If you wish to create a derived wxBitmapDataObject class in wxPython you should derive the class from wxPyBitmapDataObject in order to get Python-aware capabilities for the various virtual methods.

Virtual functions to override

This class may be used as is, but *GetBitmap* (p. 76) may be overridden to increase efficiency.

Derived from

wxDataObjectSimple (p. 202)
wxDataObject (p. 197)

Include files

<wx/dataobj.h>

See also

Clipboard and drag and drop overview (p. 1430), *wxDataObject* (p. 197), *wxDataObjectSimple* (p. 202), *wxFileDataObject* (p. 409), *wxTextDataObject* (p. 1088), *wxDataObject* (p. 197)

 wxBitmapDataObject(**const wxBitmap&** *bitmap* = *wxNullBitmap*)

Constructor, optionally passing a bitmap (otherwise use *SetBitmap* (p. 76) later).

wxBitmapDataObject::GetBitmap

virtual wxBitmap GetBitmap() const

Returns the bitmap associated with the data object. You may wish to override this method when offering data on-demand, but this is not required by wxWindows' internals. Use this method to get data in bitmap form from the *wxClipboard* (p. 121).

wxBitmapDataObject::SetBitmap

virtual void SetBitmap(const wxBitmap& *bitmap*)

Sets the bitmap associated with the data object. This method is called when the data object receives data. Usually there will be no reason to override this function.

wxBoolFormValidator

This class validates a boolean value for a *form view* (p. 832). The associated control must be a wxCheckBox.

See also

Property validator classes (p. 1463)

wxBoolFormValidator::wxBoolFormValidator

void wxBoolFormValidator(**long** *flags=0*)

Constructor.

wxBoolListValidator

This class validates a boolean value for a *property list view* (p. 839).

See also

Validator classes (p. 1463)

wxBoolListValidator::wxBoolListValidator

void wxBoolListValidator(**long** *flags=0*)

Constructor.

wxBoxSizer

The basic idea behind a box sizer is that windows will most often be laid out in rather simple basic geometry, typically in a row or a column or several hierarchies of either.

As an example, we will construct a dialog that will contain a text field at the top and two buttons at the bottom. This can be seen as a top-hierarchy column with the text at the

top and buttons at the bottom and a low-hierarchy row with an OK button to the left and a Cancel button to the right. In many cases (particularly dialogs under Unix and normal frames) the main window will be resizable by the user and this change of size will have to get propagated to its children. In our case, we want the text area to grow with the dialog, whereas the button shall have a fixed size. In addition, there will be a thin border around all controls to make the dialog look nice and - to make matter worse - the buttons shall be centred as the width of the dialog changes.

It is the unique feature of a box sizer, that it can grow in both directions (height and width) but can distribute its growth in the main direction (horizontal for a row) *unevenly* among its children. In our example case, the vertical sizer is supposed to propagate all its height changes to only the text area, not to the button area. This is determined by the *option* parameter when adding a window (or another sizer) to a sizer. It is interpreted as a weight factor, i.e. it can be zero, indicating that the window may not be resized at all, or above zero. If several windows have a value above zero, the value is interpreted relative to the sum of all weight factors of the sizer, so when adding two windows with a value of 1, they will both get resized equally much and each half as much as the sizer owning them. Then what do we do when a column sizer changes its width? This behaviour is controlled by *flags* (the second parameter of the Add() function): Zero or no flag indicates that the window will preserve it is original size, wxGROW flag (same as wxEXPAND) forces the window to grow with the sizer, and wxSHAPED flag tells the window to change it is size proportionally, preserving original aspect ratio. When wxGROW flag is not used, the item can be aligned within available space. wxALIGN_LEFT, wxALIGN_TOP, wxALIGN_RIGHT, wxALIGN_BOTTOM, wxALIGN_CENTER_HORIZONTAL and wxALIGN_CENTER_VERTICAL do what they say. wxALIGN_CENTRE (same as wxALIGN_CENTER) is defined as (wxALIGN_CENTER_HORIZONTAL | wxALIGN_CENTER_VERTICAL). Default alignment is wxALIGN_LEFT | wxALIGN_TOP.

As mentioned above, any window belonging to a sizer may have border, and it can be specified which of the four sides may have this border, using the wxTOP, wxLEFT, wxRIGHT and wxBOTTOM constants or wxALL for all directions (and you may also use wxNORTH, wxWEST etc instead). These flags can be used in combination with the alignment flags above as the second parameter of the Add() method using the binary or operator |. The sizer of the border also must be made known, and it is the third parameter in the Add() method. This means, that the entire behaviour of a sizer and its children can be controlled by the three parameters of the Add() method.

```
// we want to get a dialog that is stretchable because it
// has a text ctrl at the top and two buttons at the bottom

MyDialog::MyDialog(wxFrame *parent, wxWindowID id, const wxString
&title ) :
  wxDialog( parent, id, title, wxDefaultPosition, wxDefaultSize,
wxDIALOG_STYLE | wxRESIZE_BORDER )
{
  wxBoxSizer *topsizer = new wxBoxSizer( wxVERTICAL );

  // create text ctrl with minimal size 100x60
  topsizer->Add(
    new wxTextCtrl( this, -1, "My text.", wxDefaultPosition,
wxSize(100,60), wxTE_MULTILINE),
```

```
   1,             // make vertically stretchable
   wxEXPAND |     // make horizontally stretchable
   wxALL,         //  and make border all around
   10 );          // set border width to 10


 wxBoxSizer *button_sizer = new wxBoxSizer( wxHORIZONTAL );
 button_sizer->Add(
    new wxButton( this, wxID_OK, "OK" ),
    0,             // make horizontally unstretchable
    wxALL,         // make border all around (implicit top alignment)
    10 );          // set border width to 10
 button_sizer->Add(
    new wxButton( this, wxID_CANCEL, "Cancel" ),
    0,             // make horizontally unstretchable
    wxALL,         // make border all around (implicit top alignment)
    10 );          // set border width to 10

 topsizer->Add(
    button_sizer,
    0,                // make vertically unstretchable
    wxALIGN_CENTER ); // no border and centre horizontally

 SetAutoLayout( TRUE );     // tell dialog to use sizer
 SetSizer( topsizer );      // actually set the sizer

 topsizer->Fit( this );            // set size to minimum size as
calculated by the sizer
 topsizer->SetSizeHints( this );   // set size hints to honour mininum
size
}
```

Derived from

wxSizer (p. 929)
wxObject (p. 750)

wxBoxSizer::wxBoxSizer

 wxBoxSizer(**int** *orient*)

Constructor for a wxBoxSizer. *orient* may be either of wxVERTICAL or wxHORIZONTAL for creating either a column sizer or a row sizer.

wxBoxSizer::RecalcSizes

void RecalcSizes()

Implements the calculation of a box sizer's dimensions and then sets the size of its its children (calling *wxWindow::SetSize* (p. 1234) if the child is a window). It is used internally only and must not be called by the user. Documented for information.

wxBoxSizer::CalcMin

wxSize CalcMin()

Implements the calculation of a box sizer's minimal. It is used internally only and must not be called by the user. Documented for information.

wxBoxSizer::GetOrientation

int GetOrientation()

Returns the orientation of the box sizer, either wxVERTICAL or wxHORIZONTAL.

wxBrush

A brush is a drawing tool for filling in areas. It is used for painting the background of rectangles, ellipses, etc. It has a colour and a style.

Derived from

wxGDIObject (p. 477)
wxObject (p. 750)

Include files

<wx/brush.h>

Predefined objects

Objects:

wxNullBrush

Pointers:

wxBLUE_BRUSH
wxGREEN_BRUSH
wxWHITE_BRUSH
wxBLACK_BRUSH
wxGREY_BRUSH
wxMEDIUM_GREY_BRUSH
wxLIGHT_GREY_BRUSH
wxTRANSPARENT_BRUSH
wxCYAN_BRUSH
wxRED_BRUSH

Remarks

On a monochrome display, wxWindows shows all brushes as white unless the colour is really black.

Do not initialize objects on the stack before the program commences, since other required structures may not have been set up yet. Instead, define global pointers to objects and create them in *wxApp::OnInit* (p. 28) or when required.

An application may wish to create brushes with different characteristics dynamically, and there is the consequent danger that a large number of duplicate brushes will be created. Therefore an application may wish to get a pointer to a brush by using the global list of brushes **wxTheBrushList**, and calling the member function **FindOrCreateBrush**.

wxBrush uses a reference counting system, so assignments between brushes are very cheap. You can therefore use actual wxBrush objects instead of pointers without efficiency problems. Once one wxBrush object changes its data it will create its own brush data internally so that other brushes, which previously shared the data using the reference counting, are not affected.

See also

wxBrushList (p. 86), *wxDC* (p. 282), *wxDC::SetBrush* (p. 297)

wxBrush::wxBrush

wxBrush()

Default constructor. The brush will be uninitialised, and *wxBrush::Ok* (p. 83) will return FALSE.

wxBrush(**const wxColour&** *colour*, **int** *style*)

Constructs a brush from a colour object and style.

wxBrush(**const wxString&** *colourName*, **int** *style*)

Constructs a brush from a colour name and style.

wxBrush(**const wxBitmap&** *stippleBitmap*)

Constructs a stippled brush using a bitmap.

wxBrush(**const wxBrush&** *brush*)

Copy constructor. This uses reference counting so is a cheap operation.

Parameters

colour
    Colour object.

colourName
    Colour name. The name will be looked up in the colour database.

style
    One of:

wxTRANSPARENT	Transparent (no fill).
wxSOLID	Solid.
wxBDIAGONAL_HATCH	Backward diagonal hatch.
wxCROSSDIAG_HATCH	Cross-diagonal hatch.
wxFDIAGONAL_HATCH	Forward diagonal hatch.
wxCROSS_HATCH	Cross hatch.
wxHORIZONTAL_HATCH	Horizontal hatch.
wxVERTICAL_HATCH	Vertical hatch.

brush
    Pointer or reference to a brush to copy.

stippleBitmap
    A bitmap to use for stippling.

Remarks

If a stipple brush is created, the brush style will be set to wxSTIPPLE.

See also

wxBrushList (p. 86), *wxColour* (p. 136), *wxColourDatabase* (p. 141)

wxBrush::~wxBrush

void ~wxBrush()

Destructor.

Remarks

The destructor may not delete the underlying brush object of the native windowing system, since wxBrush uses a reference counting system for efficiency.

Although all remaining brushes are deleted when the application exits, the application should try to clean up all brushes itself. This is because wxWindows cannot know if a pointer to the brush object is stored in an application data structure, and there is a risk of double deletion.

wxBrush::GetColour

wxColour& GetColour() **const**

Returns a reference to the brush colour.

See also

wxBrush::SetColour (p. 84)

wxBrush::GetStipple

wxBitmap * GetStipple() **const**

Gets a pointer to the stipple bitmap. If the brush does not have a wxSTIPPLE style, this bitmap may be non-NULL but uninitialised (*wxBitmap::Ok* (p. 62) returns FALSE).

See also

wxBrush::SetStipple (p. 84)

wxBrush::GetStyle

int GetStyle() **const**

Returns the brush style, one of:

wxTRANSPARENT	Transparent (no fill).
wxSOLID	Solid.
wxBDIAGONAL_HATCH	Backward diagonal hatch.
wxCROSSDIAG_HATCH	Cross-diagonal hatch.
wxFDIAGONAL_HATCH	Forward diagonal hatch.
wxCROSS_HATCH	Cross hatch.
wxHORIZONTAL_HATCH	Horizontal hatch.
wxVERTICAL_HATCH	Vertical hatch.
wxSTIPPLE	Stippled using a bitmap.
wxSTIPPLE_MASK_OPAQUE	Stippled using a bitmap's mask.

See also

wxBrush::SetStyle (p. 85), *wxBrush::SetColour* (p. 84), *wxBrush::SetStipple* (p. 84)

wxBrush::Ok

bool Ok() **const**

Returns TRUE if the brush is initialised. It will return FALSE if the default constructor has been used (for example, the brush is a member of a class, or NULL has been assigned to it).

wxBrush::SetColour

void SetColour(**wxColour&** *colour*)

Sets the brush colour using a reference to a colour object.

void SetColour(**const wxString&** *colourName*)

Sets the brush colour using a colour name from the colour database.

void SetColour(**const unsigned char** *red*, **const unsigned char** *green*, **const unsigned char** *blue*)

Sets the brush colour using red, green and blue values.

See also

wxBrush::GetColour (p. 83)

wxBrush::SetStipple

void SetStipple(**const wxBitmap&** *bitmap*)

Sets the stipple bitmap.

Parameters

bitmap
    The bitmap to use for stippling.

Remarks

The style will be set to wxSTIPPLE, unless the bitmap has a mask associated to it, in which case the style will be set to wxSTIPPLE_MASK_OPAQUE.

If the wxSTIPPLE variant is used, the bitmap will be used to fill out the area to be drawn. If the wxSTIPPLE_MASK_OPAQUE is used, the current text foreground and text background determine what colours are used for displaying and the bits in the mask (which is a mono-bitmap actually) determine where to draw what.

Note that under Windows 95, only 8x8 pixel large stipple bitmaps are supported, Windows 98 and NT as well as GTK support arbitrary bitmaps.

See also

wxBitmap (p. 54)

wxBrush::SetStyle

void SetStyle(**int** *style*)

Sets the brush style.

style
>   One of:

wxTRANSPARENT	Transparent (no fill).
wxSOLID	Solid.
wxBDIAGONAL_HATCH	Backward diagonal hatch.
wxCROSSDIAG_HATCH	Cross-diagonal hatch.
wxFDIAGONAL_HATCH	Forward diagonal hatch.
wxCROSS_HATCH	Cross hatch.
wxHORIZONTAL_HATCH	Horizontal hatch.
wxVERTICAL_HATCH	Vertical hatch.
wxSTIPPLE	Stippled using a bitmap.
wxSTIPPLE_MASK_OPAQUE	Stippled using a bitmap's mask.

See also

wxBrush::GetStyle (p. 83)

wxBrush::operator =

wxBrush& operator =(**const wxBrush&** *brush*)

Assignment operator, using reference counting. Returns a reference to 'this'.

wxBrush::operator ==

bool operator ==(**const wxBrush&** *brush*)

Equality operator. Two brushes are equal if they contain pointers to the same underlying brush data. It does not compare each attribute, so two independently-created brushes using the same parameters will fail the test.

wxBrush::operator !=

bool operator !=(**const wxBrush&** *brush*)

Inequality operator. Two brushes are not equal if they contain pointers to different underlying brush data. It does not compare each attribute.

wxBrushList

A brush list is a list containing all brushes which have been created.

Derived from

wxList (p. 619)
wxObject (p. 750)

Include files

<wx/gdicmn.h>

Remarks

There is only one instance of this class: **wxTheBrushList**. Use this object to search for a previously created brush of the desired type and create it if not already found. In some windowing systems, the brush may be a scarce resource, so it can pay to reuse old resources if possible. When an application finishes, all brushes will be deleted and their resources freed, eliminating the possibility of 'memory leaks'. However, it is best not to rely on this automatic cleanup because it can lead to double deletion in some circumstances.

There are two mechanisms in recent versions of wxWindows which make the brush list less useful than it once was. Under Windows, scarce resources are cleaned up internally if they are not being used. Also, a referencing counting mechanism applied to all GDI objects means that some sharing of underlying resources is possible. You don't have to keep track of pointers, working out when it is safe delete a brush, because the referencing counting does it for you. For example, you can set a brush in a device context, and then immediately delete the brush you passed, because the brush is 'copied'.

So you may find it easier to ignore the brush list, and instead create and copy brushes as you see fit. If your Windows resource meter suggests your application is using too many resources, you can resort to using GDI lists to share objects explicitly.

The only compelling use for the brush list is for wxWindows to keep track of brushes in order to clean them up on exit. It is also kept for backward compatibility with earlier versions of wxWindows.

See also

wxBrush (p. 80)

wxBrushList::wxBrushList

void wxBrushList()

Constructor. The application should not construct its own brush list: use the object pointer **wxTheBrushList**.

wxBrushList::AddBrush

void AddBrush(**wxBrush** *brush)

Used internally by wxWindows to add a brush to the list.

wxBrushList::FindOrCreateBrush

wxBrush * **FindOrCreateBrush**(**const wxColour&** *colour*, **int** *style*)

Finds a brush with the specified attributes and returns it, else creates a new brush, adds it to the brush list, and returns it.

wxBrush * **FindOrCreateBrush**(**const wxString&** *colourName*, **int** *style*)

Finds a brush with the specified attributes and returns it, else creates a new brush, adds it to the brush list, and returns it.

Finds a brush of the given specification, or creates one and adds it to the list.

Parameters

colour
    Colour object.

colourName
    Colour name, which should be in the colour database.

style
    Brush style. See *wxBrush::SetStyle* (p. 85) for a list of styles.

wxBrushList::RemoveBrush

void RemoveBrush(**wxBrush** *brush)

Used by wxWindows to remove a brush from the list.

wxBusyCursor

This class makes it easy to tell your user that the program is temporarily busy. Just create a wxBusyCursor object on the stack, and within the current scope, the hourglass will be shown.

For example:

```
  wxBusyCursor wait;

  for (int i = 0; i < 100000; i++)
    DoACalculation();
```

It works by calling *wxBeginBusyCursor* (p. 1275) in the constructor, and *wxEndBusyCursor* (p. 1278) in the destructor.

Derived from

None

Include files

<wx/utils.h>

See also

wxBeginBusyCursor (p. 1275), *wxEndBusyCursor* (p. 1278), *wxWindowDisabler* (p. 1240)

wxBusyCursor::wxBusyCursor

wxBusyCursor(**wxCursor*** *cursor = wxHOURGLASS_CURSOR*)

Constructs a busy cursor object, calling *wxBeginBusyCursor* (p. 1275).

wxBusyCursor::~wxBusyCursor

~wxBusyCursor()

Destroys the busy cursor object, calling *wxEndBusyCursor* (p. 1278).

wxBusyInfo

This class makes it easy to tell your user that the program is temporarily busy. Just create a wxBusyInfo object on the stack, and within the current scope, a message window will be shown.

For example:

```
wxBusyInfo wait("Please wait, working...");

for (int i = 0; i < 100000; i++)
  DoACalculation();
```

It works by creating a window in the constructor, and deleting it in the destructor.

Derived from

None

Include files

<wx/busyinfo.h>

wxBusyInfo::wxBusyInfo

wxBusyInfo(**const wxString&** *msg*)

Constructs a busy info object, displays *msg*.

wxButton

A button is a control that contains a text string, and is one of the commonest elements of a GUI. It may be placed on a *dialog box* (p. 312) or *panel* (p. 769), or indeed almost any other window.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/button.h>

Window styles

wxBU_LEFT   Left-justifies the label. WIN32 only.
wxBU_TOP   Aligns the label to the top of the button. WIN32 only.
wxBU_RIGHT   Right-justifies the bitmap label. WIN32 only.
wxBU_BOTTOM   Aligns the label to the bottom of the button. WIN32 only.

See also *window styles overview* (p. 1379).

Event handling

EVT_BUTTON(id, func)   Process a wxEVT_COMMAND_BUTTON_CLICKED event, when the button is clicked.

See also

wxBitmapButton (p. 70)

wxButton::wxButton

wxButton()

Default constructor.

wxButton(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxValidator&** *validator*, **const wxString&** *name = "button"*)

Constructor, creating and showing a button.

Parameters

parent
    Parent window. Must not be NULL.

id
    Button identifier. A value of -1 indicates a default value.

label
    Text to be displayed on the button.

pos

Button position.

size

Button size. If the default size (-1, -1) is specified then the button is sized appropriately for the text.

style

Window style. See *wxButton* (p. 89).

validator

Window validator.

name

Window name.

See also

wxButton::Create (p. 91), *wxValidator* (p. 1172)

wxButton::~wxButton

 ~wxButton()

Destructor, destroying the button.

wxButton::Create

bool Create (**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxValidator&** *validator*, **const wxString&** *name = "button"*)

Button creation function for two-step creation. For more details, see *wxButton::wxButton* (p. 90).

wxButton::GetLabel

wxString GetLabel() **const**

Returns the string label for the button.

Return value

The button's label.

See also

wxButton::SetLabel (p. 92)

wxButton::GetDefaultSize

wxSize GetDefaultSize()

Returns the default size for the buttons. It is advised to make all the dialog buttons of the same size and this function allows to retrieve the (platform and current font dependent size) which should be the best suited for this.

wxButton::SetDefault

void SetDefault()

This sets the button to be the default item for the panel or dialog box.

Remarks

Under Windows, only dialog box buttons respond to this function. As normal under Windows and Motif, pressing return causes the default button to be depressed when the return key is pressed. See also *wxWindow::SetFocus* (p. 1231) which sets the keyboard focus for windows and text panel items, and *wxPanel::SetDefaultItem* (p. 771).

Note that under Motif, calling this function immediately after creation of a button and before the creation of other buttons will cause misalignment of the row of buttons, since default buttons are larger. To get around this, call *SetDefault* after you have created a row of buttons: wxWindows will then set the size of all buttons currently on the panel to the same size.

wxButton::SetLabel

void SetLabel(**const wxString&** *label*)

Sets the string label for the button.

Parameters

label
    The label to set.

See also

wxButton::GetLabel (p. 91)

wxBufferedInputStream

This stream acts as a cache. It caches the bytes read from the specified input stream (See *wxFilterInputStream* (p. 435)). It uses wxStreamBuffer and sets the default in-buffer size to 1024 bytes. This class may not be used without some other stream to read the data from (such as a file stream or a memory stream).

Derived from

wxFilterInputStream (p. 435)

Include files

<wx/stream.h>

See also

wxStreamBuffer (p. 1005), *wxInputStream* (p. 595), *wxBufferedOutputStream* (p. 93)

wxBufferedOutputStream

This stream acts as a cache. It caches the bytes to be written to the specified output stream (See *wxFilterOutputStream* (p. 435)). The data is only written when the cache is full, when the buffered stream is destroyed or when calling SeekO().

This class may not be used without some other stream to write the data to (such as a file stream or a memory stream).

Derived from

wxFilterOutputStream (p. 435)

Include files

<wx/stream.h>

See also

wxStreamBuffer (p. 1005), *wxOutputStream* (p. 755)

wxBufferedOutputStream::wxBufferedOutputStream

wxBufferedOutputStream(**const wxOutputStream&** *parent*)

Creates a buffered stream using a buffer of a default size of 1024 bytes for cashing the

stream *parent*.

wxBufferedOutputStream::~wxBufferedOutputStream

~wxBufferedOutputStream()

Destructor. Calls Sync() and destroys the internal buffer.

wxBufferedOutputStream::SeekO

off_t SeekO(**off_t** *pos*, **wxSeekMode** *mode*)

Calls Sync() and changes the stream position.

wxBufferedOutputStream::Sync

void Sync()

Flushes the buffer and calls Sync() on the parent stream.

wxCalculateLayoutEvent

This event is sent by *wxLayoutAlgorithm* (p. 614) to calculate the amount of the remaining client area that the window should occupy.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/laywin.h>

Event table macros

EVT_CALCULATE_LAYOUT(func)	Process a wxEVT_CALCULATE_LAYOUT event, which asks the window to take a 'bite' out of a rectangle provided by the algorithm.

See also

wxQueryLayoutInfoEvent (p. 860), *wxSashLayoutWindow* (p. 898), *wxLayoutAlgorithm*

(p. 614).

wxCalculateLayoutEvent::wxCalculateLayoutEvent

wxCalculateLayoutEvent(**wxWindowID** *id = 0*)

Constructor.

wxCalculateLayoutEvent::GetFlags

int GetFlags() **const**

Returns the flags associated with this event. Not currently used.

wxCalculateLayoutEvent::GetRect

wxRect GetRect() **const**

Before the event handler is entered, returns the remaining parent client area that the window could occupy. When the event handler returns, this should contain the remaining parent client rectangle, after the event handler has subtracted the area that its window occupies.

wxCalculateLayoutEvent::SetFlags

void SetFlags(**int** *flags*)

Sets the flags associated with this event. Not currently used.

wxCalculateLayoutEvent::SetRect

void SetRect(**const wxRect&** *rect*)

Call this to specify the new remaining parent client area, after the space occupied by the window has been subtracted.

wxCalendarCtrl

The calendar control allows the user to pick a date interactively. For this, it displays a

window containing several parts: the control to pick the month and the year at the top (either or both of them may be disabled) and a month area below them which shows all the days in the month. The user can move the current selection using the keyboard and select the date (generating `EVT_CALENDAR` event) by pressing `<Return>` or double clicking it.

It has advanced possibilities for the customization of its display. All global settings (such as colours and fonts used) can, of course, be changed. But also, the display style for each day in the month can be set independently using *wxCalendarDateAttr* (p. 101) class.

An item without custom attributes is drawn with the default colours and font and without border, but setting custom attributes with *SetAttr* (p. 101) allows to modify its appearance. Just create a custom attribute object and set it for the day you want to be displayed specially (note that the control will take ownership of the pointer, i.e. it will delete it itself). A day may be marked as being a holiday, even if it is not reckognized as oen by *wxDateTime* (p. 1347) using *SetHoliday* (p. 103) method.

As the attributes are specified for each day, they may change when the month is changed, so you will often want to update them in `EVT_CALENDAR_MONTH` event handler.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/calctrl.h>

Window styles

wxCAL_SUNDAY_FIRST   Show Sunday as the first day in the week

wxCAL_MONDAY_FIRST   Show Monday as the first day in the week

wxCAL_SHOW_HOLIDAYS Highlight holidays in the calendar

wxCAL_NO_YEAR_CHANGE   Disable the year changing

wxCAL_NO_MONTH_CHANGE   Disable the month (and, implicitly, the year) changing

The default calendar style is `wxCAL_SHOW_HOLIDAYS`.

Event table macros

To process input from a calendar control, use these event handler macros to direct input to member functions that take a *wxCalendarEvent* (p. 105) argument.

EVT_CALENDAR(id, func)   A day was double clickedi n the calendar.

EVT_CALENDAR_SEL_CHANGED(id, func)   The selected date changed.

EVT_CALENDAR_DAY(id, func)   The selected day changed.

EVT_CALENDAR_MONTH(id, func)   The selected month changed.

EVT_CALENDAR_YEAR(id, func)   The selected year changed.

EVT_CALENDAR_WEEKDAY_CLICKED(id, func)   User clicked on the week day header

Note that changing the selected date will result in either of EVT_CALENDAR_DAY, MONTH or YEAR events and EVT_CALENDAR_SEL_CHANGED one.

Constants

The following are the possible return values for *HitTest* (p. 101) method:

```
enum wxCalendarHitTestResult
{
    wxCAL_HITTEST_NOWHERE,      // outside of anything
    wxCAL_HITTEST_HEADER,       // on the header (weekdays)
    wxCAL_HITTEST_DAY           // on a day in the calendar
};
```

See also

Calendar sample (p. 1328)
wxCalendarDateAttr (p. 101)
wxCalendarEvent (p. 105)

wxCalendarCtrl::wxCalendarCtrl

wxCalendarCtrl()

Default constructor, use *Create* (p. 98) after it.

wxCalendarCtrl::wxCalendarCtrl

wxCalendarCtrl(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxDateTime&** *date* = *wxDefaultDateTime*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxCAL_SHOW_HOLIDAYS*, **const wxString&** *name* = *wxCalendarNameStr*)

Does the same as *Create* (p. 98) method.

wxCalendarCtrl::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxDateTime&** *date* = *wxDefaultDateTime*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxCAL_SHOW_HOLIDAYS*, **const wxString&** *name* = *wxCalendarNameStr*)

Creates the control. See *wxWindow* (p. 1191) for the meaning of the parameters and the control overview for the possible styles.

wxCalendarCtrl::~wxCalendarCtrl

~wxCalendarCtrl()

Destroys the control.

wxCalendarCtrl::SetDate

void SetDate(**const wxDateTime&** *date*)

Sets the current date.

wxCalendarCtrl::GetDate

const wxDateTime& GetDate() **const**

Gets the currently selected date.

wxCalendarCtrl::EnableYearChange

void EnableYearChange(**bool** *enable* = *TRUE*)

This function should be used instead of changing wxCAL_NO_YEAR_CHANGE style bit directly. It allows or disallows the user to chaneg the year interactively.

wxCalendarCtrl::EnableMonthChange

void EnableMonthChange (**bool** *enable* = *TRUE*)

This function should be used instead of changing `wxCAL_NO_MONTH_CHANGE` style bit. It allows or disallows the user to change the month interactively. Note that if the month can not be changed, the year can not be changed neither.

wxCalendarCtrl::EnableHolidayDisplay

void EnableHolidayDisplay(**bool** *display* = *TRUE*)

This function should be used instead of changing `wxCAL_SHOW_HOLIDAYS` style bit directly. It enables or disables the special highlighting of the holidays.

wxCalendarCtrl::SetHeaderColours

void SetHeaderColours(**const wxColour&** *colFg*, **const wxColour&** *colBg*)

Set the colours used for painting the weekdays at the top of the control.

wxCalendarCtrl::GetHeaderColourFg

const wxColour& GetHeaderColourFg() **const**

Gets the foreground colour of the header part of the calendar window.

See also

SetHeaderColours (p. 99)

wxCalendarCtrl::GetHeaderColourBg

const wxColour& GetHeaderColourBg() **const**

Gets the background colour of the header part of the calendar window.

See also

SetHeaderColours (p. 99)

wxCalendarCtrl::SetHighlightColours

void SetHighlightColours(**const wxColour&** *colFg*, **const wxColour&** *colBg*)

Set the colours to be used for highlighting the currently selected date.

wxCalendarCtrl::GetHighlightColourFg

const wxColour& GetHighlightColourFg() **const**

Gets the foreground highlight colour.

See also

SetHighlightColours (p. 99)

wxCalendarCtrl::GetHighlightColourBg

const wxColour& GetHighlightColourBg() **const**

Gets the background highlight colour.

See also

SetHighlightColours (p. 99)

wxCalendarCtrl::SetHolidayColours

void SetHolidayColours(**const wxColour&** *colFg*, **const wxColour&** *colBg*)

Sets the colours to be used for the holidays highlighting (only used if the window style includes wxCAL_SHOW_HOLIDAYS flag).

wxCalendarCtrl::GetHolidayColourFg

const wxColour& GetHolidayColourFg() **const**

Return the foregound colour currently used for holiday highlighting.

See also

SetHolidayColours (p. 100)

wxCalendarCtrl::GetHolidayColourBg

const wxColour& GetHolidayColourBg() **const**

Return the background colour currently used for holiday highlighting.

See also

SetHolidayColours (p. 100)

wxCalendarCtrl::GetAttr

wxCalendarDateAttr * GetAttr(**size_t** *day*) **const**

Returns the attribute for the given date (should be in the range 1...31).

The returned pointer may be NULL.

wxCalendarCtrl::SetAttr

void SetAttr(**size_t** *day*, **wxCalendarDateAttr*** *attr*)

Associates the attribute with the specified date (in the range 1...31).

If the pointer is NULL, the items attribute is cleared.

wxCalendarCtrl::SetHoliday

void SetHoliday(**size_t** *day*)

Marks the specified day as being a holiday in the current month.

wxCalendarCtrl::ResetAttr

void ResetAttr(**size_t** *day*)

Clears any attributes associated with the given day (in the range1...31).

wxCalendarCtrl::HitTest

wxCalendarHitTestResult HitTest(**const wxPoint&** *pos*, **wxDateTime*** *date = NULL*, **wxDateTime::WeekDay*** *wd = NULL*)

Returns one of wxCAL_HITTEST_XXX *constants* (p. 95) and fills either *date* or *wd* pointer with the corresponding value depending on the hit test code.

wxCalendarDateAttr

wxCalendarDateAttr is a custom attributes for a calendar date. The objects of this class are used with *wxCalendarCtrl* (p. 95).

Derived from

No base class

Constants

Here are the possible kinds of borders which may be used to decorate a date:

```
enum wxCalendarDateBorder

    wxCAL_BORDER_NONE,           // no border (default)
    wxCAL_BORDER_SQUARE,         // a rectangular border
    wxCAL_BORDER_ROUND           // a round border
```

See also

wxCalendarCtrl (p. 95)

wxCalendarDateAttr::wxCalendarDateAttr

wxCalendarDateAttr()

wxCalendarDateAttr(**const wxColour&** *colText*, **const wxColour&** *colBack* = *wxNullColour*, **const wxColour&** *colBorder* = *wxNullColour*, **const wxFont&** *font* = *wxNullFont*, **wxCalendarDateBorder** *border* = *wxCAL_BORDER_NONE*)

wxCalendarDateAttr(**wxCalendarDateBorder** *border*, **const wxColour&** *colBorder* = *wxNullColour*)

The constructors.

wxCalendarDateAttr::SetTextColour

void SetTextColour(**const wxColour&** *colText*)

Sets the text (foreground) colour to use.

wxCalendarDateAttr::SetBackgroundColour

void SetBackgroundColour(**const wxColour&** *colBack*)

Sets the text background colour to use.

wxCalendarDateAttr::SetBorderColour

void SetBorderColour(**const wxColour&** *col*)

Sets the border colour to use.

wxCalendarDateAttr::SetFont

void SetFont(**const wxFont&** *font*)

Sets the font to use.

wxCalendarDateAttr::SetBorder

void SetBorder(**wxCalendarDateBorder** *border*)

Sets the *border kind* (p. 101)

wxCalendarDateAttr::SetHoliday

void SetHoliday(**bool** *holiday*)

Display the date with this attribute as a holiday.

wxCalendarDateAttr::HasTextColour

bool HasTextColour() **const**

Returns TRUE if this item has a non default text foreground colour.

wxCalendarDateAttr::HasBackgroundColour

bool HasBackgroundColour() **const**

Returns TRUE if this attribute specifies a non default text background colour.

wxCalendarDateAttr::HasBorderColour

bool HasBorderColour() const

Returns TRUE if this attribute specifies a non default border colour.

wxCalendarDateAttr::HasFont

bool HasFont() const

Returns TRUE if this attribute specifies a non default font.

wxCalendarDateAttr::HasBorder

bool HasBorder() const

Returns TRUE if this attribute specifies a non default (i.e. any) border.

wxCalendarDateAttr::IsHoliday

bool IsHoliday() const

Returns TRUE if this attribute specifies that this item should be displayed as a holiday.

wxCalendarDateAttr::GetTextColour

const wxColour& GetTextColour() const

Returns the text colour to use for the item with this attribute.

wxCalendarDateAttr::GetBackgroundColour

const wxColour& GetBackgroundColour() const

Returns the background colour to use for the item with this attribute.

wxCalendarDateAttr::GetBorderColour

const wxColour& GetBorderColour() const

Returns the border colour to use for the item with this attribute.

wxCalendarDateAttr::GetFont

const wxFont& GetFont() **const**

Returns the font to use for the item with this attribute.

wxCalendarDateAttr::GetBorder

wxCalendarDateBorder GetBorder() **const**

Returns the *border* (p. 101) to use for the item with this attribute.

wxCalendarEvent

The wxCalendarEvent class is used together with *wxCalendarCtrl* (p. 95).

See also

wxCalendarCtrl (p. 95)

wxCalendarEvent::GetDate

wxcalendareventgetdate

const wxDateTime& GetDate() **const**

Returns the date. This function may be called for all event types except
EVT_CALENDAR_WEEKDAY_CLICKED one for which it doesn't make sense.

wxCalendarEvent::GetWeekDay

wxcalendareventgetweekday

wxDateTime::WeekDay GetWeekDay() **const**

Returns the week day on which the user clicked in EVT_CALENDAR_WEEKDAY_CLICKED
handler. It doesn't make sense to call this function in other handlers.

wxCaret

A caret is a blinking cursor showing the position where the typed text will appear. The text controls usually have a caret but wxCaret class also allows to use a caret in other windows.

Currently, the caret appears as a rectangle of the given size. In the future, it will be possible to specify a bitmap to be used for the caret shape.

A caret is always associated with a window and the current caret can be retrieved using *wxWindow::GetCaret* (p. 1200). The same caret can't be reused in two different windows.

Derived from

No base class

Include files

<wx/caret.h>

Data structures

wxCaret::wxCaret

wxCaret()

Default constructor: you must use one of Create() functions later.

wxCaret(**wxWindow*** *window*, **int** *width*, **int** *height*)

wxCaret(**wxWindowBase*** *window*, **const wxSize&** *size*)

Create the caret of given (in pixels) width and height and associates it with the given window.

wxCaret::Create

bool Create(**wxWindowBase*** *window*, **int** *width*, **int** *height*)

bool Create(**wxWindowBase*** *window*, **const wxSize&** *size*)

Create the caret of given (in pixels) width and height and associates it with the given window (same as constructor).

wxCaret::GetBlinkTime

static int GetBlinkTime()

Returns the blink time which is measured in milliseconds and is the time elapsed between 2 inversions of the caret (blink time of the caret is the same for all carets, so this functions is static).

wxCaret::GetPosition

void GetPosition(**int*** *x*, **int*** *y*) **const**

wxPoint GetPosition() **const**

Get the caret position (in pixels).

wxCaret::GetSize

void GetSize(**int*** *width*, **int*** *height*) **const**

wxSize GetSize() **const**

Get the caret size.

wxCaret::GetWindow

wxWindow* GetWindow() **const**

Get the window the caret is associated with.

wxCaret::Hide

void Hide()

Same as *wxCaret::Show(FALSE)* (p. 108).

wxCaret::IsOk

bool IsOk() **const**

Returns TRUE if the caret was created successfully.

wxCaret::IsVisible

bool IsVisible() **const**

Returns TRUE if the caret is visible and FALSE if it is permanently hidden (if it is is blinking and not shown currently but will be after the next blink, this method still returns TRUE).

wxCaret::Move

void Move(**int** *x*, **int** *y*)

void Move(**const wxPoint&** *pt*)

Move the caret to given position (in logical coordinates).

wxCaret::SetBlinkTime

static void SetBlinkTime(**int** *milliseconds*)

Sets the blink time for all the carets.

Remarks

Under Windows, this function will change the blink time for **all** carets permanently (until the next time it is called), even for the carets in other applications.

See also

GetBlinkTime (p. 106)

wxCaret::SetSize

void SetSize(**int** *width*, **int** *height*)

void SetSize(**const wxSize&** *size*)

Changes the size of the caret.

wxCaret::Show

void Show(**bool** *show = TRUE*)

Shows or hides the caret. Notice that if the caret was hidden N times, it must be shown N times as well to reappear on the screen.

wxCheckBox

A checkbox is a labelled box which is either on (checkmark is visible) or off (no checkmark).

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/checkbox.h>

Window styles

There are no special styles for wxCheckBox.

See also *window styles overview* (p. 1379).

Event handling

EVT_CHECKBOX(id, func)	Process a wxEVT_COMMAND_CHECKBOX_CLICKED event, when the checkbox is clicked.

See also

wxRadioButton (p. 869), *wxCommandEvent* (p. 153)

wxCheckBox::wxCheckBox

wxCheckBox()

Default constructor.

wxCheckBox(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxValidator&** *val*, **const wxString&** *name = "checkBox"*)

Constructor, creating and showing a checkbox.

Parameters

parent
    Parent window. Must not be NULL.

id
> Checkbox identifier. A value of -1 indicates a default value.

label
> Text to be displayed next to the checkbox.

pos
> Checkbox position. If the position (-1, -1) is specified then a default position is chosen.

size
> Checkbox size. If the default size (-1, -1) is specified then a default size is chosen.

style
> Window style. See *wxCheckBox* (p. 108).

validator
> Window validator.

name
> Window name.

See also

wxCheckBox::Create (p. 110), *wxValidator* (p. 1172)

wxCheckBox::~wxCheckBox

~wxCheckBox()

Destructor, destroying the checkbox.

wxCheckBox::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxValidator&** *val*, **const wxString&** *name = "checkBox"*)

Creates the checkbox for two-step construction. See *wxCheckBox::wxCheckBox* (p. 109) for details.

wxCheckBox::GetValue

bool GetValue() **const**

Gets the state of the checkbox.

Return value

Returns TRUE if it is checked, FALSE otherwise.

wxCheckBox::SetValue

void SetValue(**const bool** *state*)

Sets the checkbox to the given state. This does not cause a
wxEVT_COMMAND_CHECKBOX_CLICKED event to get emitted.

Parameters

state
    If TRUE, the check is on, otherwise it is off.

wxCheckListBox

A checklistbox is like a listbox, but allows items to be checked or unchecked.

This class is currently implemented under Windows and GTK. When using this class
under Windows wxWindows must be compiled with USE_OWNER_DRAWN set to 1.

Only the new functions for this class are documented; see also *wxListBox* (p. 625).

Derived from

wxListBox (p. 625)
wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/checklst.h>

Window styles

See *wxListBox* (p. 625).

Event handling

EVT_CHECKLISTBOX(id, func)   Process a
                                        wxEVT_COMMAND_CHECKLISTBOX_TOGG

LE event, when an item in the check list box is checked or unchecked.

See also

wxListBox (p. 625), *wxChoice* (p. 113), *wxComboBox* (p. 144), *wxListCtrl* (p. 634), *wxCommandEvent* (p. 153)

wxCheckListBox::wxCheckListBox

wxCheckListBox()

Default constructor.

wxCheckListBox(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **int** *n*, **const wxString** *choices[] = NULL*, **long** *style = 0*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"listBox"*)

Constructor, creating and showing a list box.

Parameters

parent
Parent window. Must not be NULL.

id
Window identifier. A value of -1 indicates a default value.

pos
Window position.

size
Window size. If the default size (-1, -1) is specified then the window is sized appropriately.

n
Number of strings with which to initialise the control.

choices
An array of strings with which to initialise the control.

style
Window style. See *wxCheckListBox* (p. 111).

validator
Window validator.

name
    Window name.

wxPython note: The wxCheckListBox constructor in wxPython reduces the `n` and `choices` arguments are to a single argument, which is a list of strings.

wxCheckListBox::~wxCheckListBox

void ~wxCheckListBox()

Destructor, destroying the list box.

wxCheckListBox::Check

void Check(**int** *item*, **bool** *check = TRUE*)

Checks the given item.

Parameters

item
    Index of item to check.

check
    TRUE if the item is to be checked, FALSE otherwise.

wxCheckListBox::IsChecked

bool IsChecked(**int** *item*) **const**

Returns TRUE if the given item is checked, FALSE otherwise.

Parameters

item
    Index of item whose check status is to be returned.

wxChoice

A choice item is used to select one of a list of strings. Unlike a listbox, only the selection is visible until the user pulls down the menu of choices.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/choice.h>

Window styles

There are no special styles for wxChoice.

See also *window styles overview* (p. 1379).

Event handling

EVT_CHOICE(id, func)	Process a wxEVT_COMMAND_CHOICE_SELECTED event, when an item on the list is selected.

See also

wxListBox (p. 625), *wxComboBox* (p. 144), *wxCommandEvent* (p. 153)

wxChoice::wxChoice

wxChoice()

Default constructor.

wxChoice(**wxWindow** *parent, **wxWindowID** *id*, **const wxPoint&** *pos*, **const wxSize&** *size*, **int** *n*, **const wxString** *choices[]*, **long** *style = 0*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "choice"*)

Constructor, creating and showing a choice.

Parameters

parent
    Parent window. Must not be NULL.

id
    Window identifier. A value of -1 indicates a default value.

pos

Window position.

size

Window size. If the default size (-1, -1) is specified then the choice is sized appropriately.

n

Number of strings with which to initialise the choice control.

choices

An array of strings with which to initialise the choice control.

style

Window style. See *wxChoice* (p. 113).

validator

Window validator.

name

Window name.

See also

wxChoice::Create (p. 116), *wxValidator* (p. 1172)

wxPython note: The wxChoice constructor in wxPython reduces the `n` and `choices` arguments are to a single argument, which is a list of strings.

wxChoice::~wxChoice

~wxChoice()

Destructor, destroying the choice item.

wxChoice::Append

void Append(**const wxString&** *item*)

Adds the item to the end of the choice control.

void Append(**const wxString&** *item*, **void*** *clientData*)

Adds the item to the end of the combobox, associating the given data with the item.

Parameters

item

String to add.

clientData
    Client data to associate with the item.

wxChoice::Clear

void Clear()

Clears the strings from the choice item.

wxChoice::Create

bool Create(**wxWindow** **parent*, **wxWindowID** *id*, **const wxPoint&** *pos*, **const wxSize&** *size*, **int** *n*, **const wxString** *choices[]*, **long** *style = 0*, **const wxString&** *name = "choice"*)

Creates the choice for two-step construction. See *wxChoice::wxChoice* (p. 114).

wxChoice::FindString

int FindString(**const wxString&** *string*) **const**

Finds a choice matching the given string.

Parameters

string
    String to find.

Return value

Returns the position if found, or -1 if not found.

wxChoice::GetColumns

int GetColumns() **const**

Gets the number of columns in this choice item.

Remarks

This is implemented for Motif only.

wxChoice::GetClientData

void* GetClientData(**int** *n*) **const**

Returns a pointer to the client data associated with the given item (if any).

Parameters

n
An item, starting from zero.

Return value

A pointer to the client data, or NULL if the item was not found.

wxChoice::GetSelection

int GetSelection() **const**

Gets the id (position) of the selected string, or -1 if there is no selection.

wxChoice::GetString

wxString GetString(**int** *n*) **const**

Returns the string at the given position.

Parameters

n
The zero-based position.

Return value

The string at the given position, or the empty string if *n* is invalid.

wxChoice::GetStringSelection

wxString GetStringSelection() **const**

Gets the selected string, or the empty string if no string is selected.

wxChoice::Number

int Number() **const**

Returns the number of strings in the choice control.

wxChoice::SetClientData

void SetClientData(**int** *n*, **void*** *data*)

Associates the given client data pointer with the given item.

Parameters

n
    The zero-based item.

data
    The client data.

wxChoice::SetColumns

void SetColumns(**int** *n = 1*)

Sets the number of columns in this choice item.

Parameters

n
    Number of columns.

Remarks

This is implemented for Motif only.

wxChoice::SetSelection

void SetSelection(**int** *n*)

Sets the choice by passing the desired string position. This does not cause a wxEVT_COMMAND_CHOICE_SELECTED event to get emitted.

Parameters

n
    The string position to select, starting from zero.

See also

wxChoice::SetStringSelection (p. 118)

wxChoice::SetStringSelection

void SetStringSelection(**const wxString&** *string*)

Sets the choice by passing the desired string. This does not cause a wxEVT_COMMAND_CHOICE_SELECTED event to get emitted.

Parameters

string
    The string to select.

See also

wxChoice::SetSelection (p. 118)

wxClassInfo

This class stores meta-information about classes. Instances of this class are not generally defined directly by an application, but indirectly through use of macros such as **DECLARE_DYNAMIC_CLASS** and **IMPLEMENT_DYNAMIC_CLASS**.

Derived from

No parent class.

Include files

<wx/object.h>

See also

Overview (p. 1338), *wxObject* (p. 750)

wxClassInfo::wxClassInfo

 wxClassInfo(**char*** *className*, **char*** *baseClass1*, **char*** *baseClass2*, **int** *size*, **wxObjectConstructorFn** *fn*)

Constructs a wxClassInfo object. The supplied macros implicitly construct objects of this class, so there is no need to create such objects explicitly in an application.

wxClassInfo::CreateObject

wxObject* CreateObject()

Creates an object of the appropriate kind. Returns NULL if the class has not been declared dynamically creatable (typically, it is an abstract class).

wxClassInfo::FindClass

static wxClassInfo * FindClass(**char*** *name*)

Finds the wxClassInfo object for a class of the given string name.

wxClassInfo::GetBaseClassName1

char* GetBaseClassName1() **const**

Returns the name of the first base class (NULL if none).

wxClassInfo::GetBaseClassName2

char* GetBaseClassName2() **const**

Returns the name of the second base class (NULL if none).

wxClassInfo::GetClassName

char * GetClassName() **const**

Returns the string form of the class name.

wxClassInfo::GetSize

int GetSize() **const**

Returns the size of the class.

wxClassInfo::InitializeClasses

static void InitializeClasses()

Initializes pointers in the wxClassInfo objects for fast execution of IsKindOf. Called in base wxWindows library initialization.

wxClassInfo::IsKindOf

bool IsKindOf(**wxClassInfo*** *info*)

Returns TRUE if this class is a kind of (inherits from) the given class.

wxClientDC

A wxClientDC must be constructed if an application wishes to paint on the client area of a window from outside an **OnPaint** event. This should normally be constructed as a temporary stack object; don't store a wxClientDC object.

To draw on a window from within **OnPaint**, construct a *wxPaintDC* (p. 763) object.

To draw on the whole window including decorations, construct a *wxWindowDC* (p. 1240) object (Windows only).

Derived from

wxWindowDC (p. 1240)
wxDC (p. 282)

Include files

<wx/dcclient.h>

See also

wxDC (p. 282), *wxMemoryDC* (p. 682), *wxPaintDC* (p. 763), *wxWindowDC* (p. 1240), *wxScreenDC* (p. 906)

wxClientDC::wxClientDC

wxClientDC(**wxWindow*** *window*)

Constructor. Pass a pointer to the window on which you wish to paint.

wxClipboard

A class for manipulating the clipboard. Note that this is not compatible with the clipboard

class from wxWindows 1.xx, which has the same name but a different implementation.

To use the clipboard, you call member functions of the global **wxTheClipboard** object.

See also the *wxDataObject overview* (p. 1432) for further information.

Call *wxClipboard::Open* (p. 124) to get ownership of the clipboard. If this operation returns TRUE, you now own the clipboard. Call *wxClipboard::SetData* (p. 124) to put data on the clipboard, or *wxClipboard::GetData* (p. 123) to retrieve data from the clipboard. Call *wxClipboard::Close* (p. 123) to close the clipboard and relinquish ownership. You should keep the clipboard open only momentarily.

For example:

```
// Write some text to the clipboard
if (wxTheClipboard->Open())
{
  // This data objects are held by the clipboard,
  // so do not delete them in the app.
  wxTheClipboard->SetData( new wxTextDataObject("Some text") );
  wxTheClipboard->Close();
}

// Read some text
if (wxTheClipboard->Open())
{
  if (wxTheClipboard->IsSupported( wxDF_TEXT ))
  {
    wxTextDataObject data;
    wxTheClipboard->GetData( data );
    wxMessageBox( data.GetText() );
  }
  wxTheClipboard->Close();
}
```

Derived from

wxObject (p. 750)

Include files

<wx/clipbrd.h>

See also

Drag and drop overview (p. 1430), *wxDataObject* (p. 197)

wxClipboard::wxClipboard

wxClipboard()

Constructor.

wxClipboard::~wxClipboard

~wxClipboard()

Destructor.

wxClipboard::AddData

bool AddData(**wxDataObject*** *data*)

Call this function to add the data object to the clipboard. You may call this function repeatedly after having cleared the clipboard using *wxClipboard::Clear* (p. 123).

After this function has been called, the clipboard owns the data, so do not delete the data explicitly.

See also

wxClipboard::SetData (p. 124)

wxClipboard::Clear

void Clear()

Clears the global clipboard object and the system's clipboard if possible.

wxClipboard::Close

bool Close()

Call this function to close the clipboard, having opened it with *wxClipboard::Open* (p. 124).

wxClipboard::GetData

bool GetData(**wxDataObject&** *data*)

Call this function to fill *data* with data on the clipboard, if available in the required format. Returns TRUE on success.

wxClipboard::IsOpened

bool IsOpened() **const**

Returns TRUE if the clipboard has been opened.

wxClipboard::IsSupported

bool IsSupported(**const wxDataFormat&** *format*)

Returns TRUE if the format of the given data object is available on the clipboard.

wxClipboard::Open

bool Open()

Call this function to open the clipboard before calling *wxClipboard::SetData* (p. 124) and *wxClipboard::GetData* (p. 123).

Call *wxClipboard::Close* (p. 123) when you have finished with the clipboard. You should keep the clipboard open for only a very short time.

Returns TRUE on success. This should be tested (as in the sample shown above).

wxClipboard::SetData

bool SetData(**wxDataObject*** *data*)

Call this function to set the data object to the clipboard. This function will clear all previous contents in the clipboard, so calling it several times does not make any sense.

After this function has been called, the clipboard owns the data, so do not delete the data explicitly.

See also

wxClipboard::AddData (p. 123)

wxClipboard::UsePrimarySelection

void UsePrimarySelection(**bool** *primary = TRUE*)

On platforms supporting it (currently only GTK), selects the so called PRIMARY SELECTION as the clipboard as opposed to the normal clipboard, if *primary* is TRUE.

wxCloseEvent

This event class contains information about window and session close events.

Derived from

wxEvent (p. 377)

Include files

<wx/event.h>

Event table macros

To process a close event, use these event handler macros to direct input to member functions that take a wxCloseEvent argument.

EVT_CLOSE(func)	Process a close event, supplying the member function. This event applies to wxFrame and wxDialog classes.
EVT_QUERY_END_SESSION(func)	Process a query end session event, supplying the member function. This event applies to wxApp only.
EVT_END_SESSION(func)	Process an end session event, supplying the member function. This event applies to wxApp only.

See also

wxWindow::OnCloseWindow (p. 1213), *wxWindow::Close* (p. 1195), *wxApp::OnQueryEndSession* (p. 28), *wxApp::OnEndSession* (p. 27), *Window deletion overview* (p. 1379)

wxCloseEvent::wxCloseEvent

wxCloseEvent(**WXTYPE** *commandEventType = 0*, **int** *id = 0*)

Constructor.

wxCloseEvent::CanVeto

bool CanVeto()

Returns TRUE if you can veto a system shutdown or a window close event. Vetoing a window close event is not possible if the calling code wishes to force the application to exit, and so this function must be called to check this.

wxCloseEvent::GetLoggingOff

bool GetLoggingOff() **const**

Returns TRUE if the user is logging off.

wxCloseEvent::GetSessionEnding

bool GetSessionEnding() **const**

Returns TRUE if the session is ending.

wxCloseEvent::GetForce

bool GetForce() **const**

Returns TRUE if the application wishes to force the window to close. This will shortly be obsolete, replaced by CanVeto.

wxCloseEvent::SetCanVeto

void SetCanVeto(**bool** *canVeto*)

Sets the 'can veto' flag.

wxCloseEvent::SetForce

void SetForce(**bool** *force*) **const**

Sets the 'force' flag.

wxCloseEvent::SetLoggingOff

void SetLoggingOff(**bool** *loggingOff*) **const**

Sets the 'logging off' flag.

wxCloseEvent::Veto

void Veto(**bool** *veto = TRUE*)

Call this from your event handler to veto a system shutdown or to signal to the calling application that a window close did not happen.

You can only veto a shutdown if *wxCloseEvent::CanVeto* (p. 125) returns TRUE.

wxCmdLineParser

wxCmdLineParser is a class for parsing command line.

It has the following features:
   1. distinguishes options, switches and parameters; allows option grouping
   2. allows both short and long options
   3. automatically generates the usage message from the command line description
   4. does type checks on the options values (number, date, ...).

To use it you should follow these steps:
   1. *construct* (p. 129) an object of this class giving it the command line to parse and optionally its description or use `AddXXX()` functions later

   2. call `Parse()`

   3. use `Found()` to retrieve the results

In the documentation below the following terminology is used:

switch	This is a boolean option which can be given or not, but which doesn't have any value. We use the word switch to distinguish such boolean options from more generic options like those described below. For example, `-v` might be a switch meaning "enable verbose mode".
option	Option for us here is something which comes with a value 0 unlike a switch. For example, `-o:filename` might be an option which allows to specify the name of the output file.
parameter	This is a required program argument.

Derived from

No base class

Include files

<wx/cmdline.h>

Constants

The structure wxCmdLineEntryDesc is used to describe the one command line switch, option or parameter. An array of such structures should be passed to *SetDesc()* (p. 133). Also, the meanings of parameters of the AddXXX() functions are the same as of the corresponding fields in this structure:

```
struct wxCmdLineEntryDesc
{
    wxCmdLineEntryType kind;
    const wxChar *shortName;
    const wxChar *longName;
    const wxChar *description;
    wxCmdLineParamType type;
    int flags;
};
```

The type of a command line entity is in the kind field and may be one of the following constants:

```
enum wxCmdLineEntryType

    wxCMD_LINE_SWITCH,
    wxCMD_LINE_OPTION,
    wxCMD_LINE_PARAM,
    wxCMD_LINE_NONE          // use this to terminate the list
```

The field shortName is the usual, short, name of the switch or the option. longName is the corresponding long name or NULL if the option has no long name. Both of these fields are unused for the parameters. Both the short and long option names can contain only letters, digits and the underscores.

description is used by the *Usage()* (p. 134) method to construct a help message explaining the syntax of the program.

The possible values of type which specifies the type of the value accepted by an option or parameter are:

```
enum wxCmdLineParamType

    wxCMD_LINE_VAL_STRING,  // default
    wxCMD_LINE_VAL_NUMBER,
    wxCMD_LINE_VAL_DATE,
    wxCMD_LINE_VAL_NONE
```

Finally, the flags field is a combination of the following bit masks:

```
enum

    wxCMD_LINE_OPTION_MANDATORY = 0x01, // this option must be given
    wxCMD_LINE_PARAM_OPTIONAL   = 0x02, // the parameter may be omitted
    wxCMD_LINE_PARAM_MULTIPLE   = 0x04, // the parameter may be
repeated
    wxCMD_LINE_OPTION_HELP      = 0x08, // this option is a help
request
    wxCMD_LINE_NEEDS_SEPARATOR  = 0x10, // must have sep before the
value
```

Notice that by default (i.e. if flags are just 0), options are optional (sic) and each call to *AddParam()* (p. 134) allows one more parameter - this may be changed by giving non-default flags to it, i.e. use `wxCMD_LINE_OPTION_MANDATORY` to require that the option is given and `wxCMD_LINE_PARAM_OPTIONAL` to make a parameter optional. Also, `wxCMD_LINE_PARAM_MULTIPLE` may be specified if the programs accepts a variable number of parameters - but it only can be given for the last parameter in the command line description. If you use this flag, you will probably need to use *GetParamCount* (p. 135) to retrieve the number of parameters effectively specified after calling *Parse* (p. 134).

The last flag `wxCMD_LINE_NEEDS_SEPARATOR` can be specified to require a separator (either a colon, an equal sign or white space) between the option name and its value. By default, no separator is required.

See also

wxApp::argc (p. 22) and *wxApp::argv* (p. 23)
console sample

Construction

Before *Parse* (p. 134) can be called, the command line parser object must have the command line to parse and also the rules saying which switches, options and parameters are valid - this is called command line description in what follows.

You have complete freedom of choice as to when specify the required information, the only restriction is that it must be done before calling *Parse* (p. 134).

To specify the command line to parse you may use either one of constructors accepting it (*wxCmdLineParser(argc, argv)* (p. 131) or *wxCmdLineParser* (p. 131) usually) or, if you use *the default constructor* (p. 131), you can do it later by calling *SetCmdLine* (p. 132).

The same holds for command line description: it can be specified either in the constructor (*without command line* (p. 131) or *together with it* (p. 131)) or constructed

later using either *SetDesc* (p. 133) or combination of *AddSwitch* (p. 134), *AddOption* (p. 134) and *AddParam* (p. 134) methods.

Using constructors or *SetDesc* (p. 133) uses a (usually `const static`) table containing the command line description. If you want to decide which options to acccept during the run-time, using one of the `AddXXX()` functions above might be preferable.

Customization

wxCmdLineParser has several global options which may be changed by the application. All of the functions described in this section should be called before *Parse* (p. 134).

First global option is the support for long (also known as GNU-style) options. The long options are the ones which start with two dashes (`"--"`) and look like this: `--verbose`, i.e. they generally are complete words and not some abbreviations of them. As long options are used by more and more applications, they are enabled by default, but may be disabled with *DisableLongOptions* (p. 133).

Another global option is the set of characters which may be used to start an option (otherwise, the word on the command line is assumed to be a parameter). Under Unix, `'-'` is always used, but Windows has at least two common choices for this: `'-'` and `'/'`. Some programs also use `'+'`. The default is to use what suits most the current platform, but may be changed with *SetSwitchChars* (p. 132) method.

Finally, *SetLogo* (p. 133) can be used to show some application-specific text before the explanation given by *Usage* (p. 134) function.

Parsing command line

After the command line description was constructed and the desiredoptions were set, you can finally call *Parse* (p. 134) method. It returns 0 if the command line was correct and was parsed, -1 if the help option was specified (this is a separate case as, normally, the program will terminate after this) or a positive number if there was an error during the command line parsing.

In the latter case, the appropriate error message and usage information are logged by wxCmdLineParser itself using the standard wxWindows logging functions.

Getting results

After calling *Parse* (p. 134) (and if it returned 0), you may access the results of parsing using one of overloaded `Found()`methods.

For a simple switch, you will simply call *Found* (p. 135) to determine if the switch was given or not, for an option or a parameter, you will call a version of `Found()` which also returns the associated value in the provided variable. All `Found()` functions return

TRUE if the switch or option were found in the command line or FALSE if they were not specified.

wxCmdLineParser::wxCmdLineParser

wxCmdLineParser()

Default constructor. You must use *SetCmdLine* (p. 132) or *SetCmdLinelater.* (p. 132) later.

wxCmdLineParser::wxCmdLineParser

wxCmdLineParser(**int** *argc*, **char**** *argv*)

Constructor specifies the command line to parse. This is the traditional (Unix) command line format. The parameters *argc* and *argv* have the same meaning as for main() function.

wxCmdLineParser::wxCmdLineParser

wxCmdLineParser(**const wxString&** *cmdline*)

Constructor specifies the command line to parse in Windows format. The parameter *cmdline* has the same meaning as the corresponding parameter of WinMain().

wxCmdLineParser::wxCmdLineParser

wxCmdLineParser(**const wxCmdLineEntryDesc*** *desc*)

Same as *wxCmdLineParser* (p. 131), but also specifies the *command line description* (p. 133).

wxCmdLineParser::wxCmdLineParser

wxCmdLineParser(**const wxCmdLineEntryDesc*** *desc*, **int** *argc*, **char**** *argv*)

Same as *wxCmdLineParser* (p. 131), but also specifies the *command line description* (p. 133).

wxCmdLineParser::wxCmdLineParser

wxCmdLineParser(**const wxCmdLineEntryDesc*** *desc*, **const wxString&** *cmdline*)

Same as *wxCmdLineParser* (p. 131), but also specifies the *command line description* (p. 133).

wxCmdLineParser::SetCmdLine

void SetCmdLine(**int** *argc*, **char**** *argv*)

Set command line to parse after using one of the constructors which don't do it.

See also

wxCmdLineParser (p. 131)

wxCmdLineParser::SetCmdLine

void SetCmdLine(**const wxString&** *cmdline*)

Set command line to parse after using one of the constructors which don't do it.

See also

wxCmdLineParser (p. 131)

wxCmdLineParser::~wxCmdLineParser

~wxCmdLineParser()

Frees resources allocated by the object.

NB: destructor is not virtual, don't use this class polymorphically.

wxCmdLineParser::SetSwitchChars

void SetSwitchChars(**const wxString&** *switchChars*)

switchChars contains all characters with which an option or switch may start. Default is " – " for Unix, " – / " for Windows.

wxCmdLineParser::EnableLongOptions

void EnableLongOptions(**bool** *enable* = *TRUE*)

Enable or disable support for the long options.

As long options are not (yet) POSIX-compliant, this option allows to disable them.

See also

Customization (p. 130)

wxCmdLineParser::DisableLongOptions

void DisableLongOptions()

Ientical to *EnableLongOptions(FALSE)* (p. 132).

wxCmdLineParser::SetLogo

void SetLogo(const wxString& *logo*)

logo is some extra text which will be shown by *Usage* (p. 134) method.

wxCmdLineParser::SetDesc

void SetDesc(const wxCmdLineEntryDesc* *desc*)

Construct the command line description

Take the command line description from the wxCMD_LINE_NONE terminated table.

Example of usage:

```
static const wxCmdLineEntryDesc cmdLineDesc[] =
{
    { wxCMD_LINE_SWITCH, "v", "verbose", "be verbose" },
    { wxCMD_LINE_SWITCH, "q", "quiet",   "be quiet" },

    { wxCMD_LINE_OPTION, "o", "output",  "output file" },
    { wxCMD_LINE_OPTION, "i", "input",   "input dir" },
    { wxCMD_LINE_OPTION, "s", "size",    "output block size",
wxCMD_LINE_VAL_NUMBER },
    { wxCMD_LINE_OPTION, "d", "date",    "output file date",
wxCMD_LINE_VAL_DATE },

    { wxCMD_LINE_PARAM,  NULL, NULL, "input file",
wxCMD_LINE_VAL_STRING, wxCMD_LINE_PARAM_MULTIPLE },

    { wxCMD_LINE_NONE }
};

wxCmdLineParser parser;
```

```
parser.SetDesc(cmdLineDesc);
```

wxCmdLineParser::AddSwitch

void AddSwitch(**const wxString&** *name*, **const wxString&** *lng = wxEmptyString*, **const wxString&** *desc = wxEmptyString*, **int** *flags = 0*)

Add a switch *name* with an optional long name *lng* (no long name if it is empty, which is default), description *desc* and flags *flags* to the command line description.

wxCmdLineParser::AddOption

void AddOption(**const wxString&** *name*, **const wxString&** *lng = wxEmptyString*, **const wxString&** *desc = wxEmptyString*, **wxCmdLineParamType** *type = wxCMD_LINE_VAL_STRING*, **int** *flags = 0*)

Add an option *name* with an optional long name *lng* (no long name if it is empty, which is default) taking a value of the given type (string by default) to the command line description.

wxCmdLineParser::AddParam

void AddParam(**const wxString&** *desc = wxEmptyString*, **wxCmdLineParamType** *type = wxCMD_LINE_VAL_STRING*, **int** *flags = 0*)

Add a parameter of the given *type* to the command line description.

wxCmdLineParser::Parse

int Parse()

Parse the command line, return 0 if ok, -1 if `"-h"` or `"--help"` option was encountered and the help message was given or a positive value if a syntax error occured.

wxCmdLineParser::Usage

void Usage()

Give the standard usage message describing all program options. It will use the options and parameters descriptions specified earlier, so the resulting message will not be helpful to the user unless the descriptions were indeed specified.

See also

SetLogo (p. 133)

wxCmdLineParser::Found

bool Found(**const wxString&** *name*) **const**

Returns TRUE if the given switch was found, FALSE otherwise.

wxCmdLineParser::Found

bool Found(**const wxString&** *name*, **wxString*** *value*) **const**

Returns TRUE if an option taking a string value was found and stores the value in the provided pointer (which should not be NULL).

wxCmdLineParser::Found

bool Found(**const wxString&** *name*, **long*** *value*) **const**

Returns TRUE if an option taking an integer value was found and stores the value in the provided pointer (which should not be NULL).

wxCmdLineParser::Found

bool Found(**const wxString&** *name*, **wxDateTime*** *value*) **const**

Returns TRUE if an option taking a date value was found and stores the value in the provided pointer (which should not be NULL).

wxCmdLineParser::GetParamCount

size_t GetParamCount() **const**

Returns the number of parameters found. This function makes sense mostly if you had used wxCMD_LINE_PARAM_MULTIPLE flag.

wxCmdLineParser::GetParam

wxString GetParam(**size_t** *n = 0u*) **const**

Returns the value of Nth parameter (as string only for now).

See also

GetParamCount (p. 135)

wxColour

A colour is an object representing a combination of Red, Green, and Blue (RGB) intensity values, and is used to determine drawing colours. See the entry for *wxColourDatabase* (p. 141) for how a pointer to a predefined, named colour may be returned instead of creating a new colour.

Valid RGB values are in the range 0 to 255.

Derived from

wxObject (p. 750)

Include files

<wx/colour.h>

Predefined objects

Objects:

wxNullColour

Pointers:

wxBLACK
wxWHITE
wxRED
wxBLUE
wxGREEN
wxCYAN
wxLIGHT_GREY

See also

wxColourDatabase (p. 141), *wxPen* (p. 775), *wxBrush* (p. 80), *wxColourDialog* (p. 142)

wxColour::wxColour

wxColour()

Default constructor.

wxColour(**const unsigned char** *red*, **const unsigned char** *green*, **const unsigned char** *blue*)

Constructs a colour from red, green and blue values.

wxColour(**const wxString&** *colourNname*)

Constructs a colour object using a colour name listed in **wxTheColourDatabase**.

wxColour(**const wxColour&** *colour*)

Copy constructor.

Parameters

red
   The red value.

green
   The green value.

blue
   The blue value.

colourName
   The colour name.

colour
   The colour to copy.

See also

wxColourDatabase (p. 141)

wxPython note: Constructors supported by wxPython are:

> **wxColour(red=0, green=0, blue=0)**
> **wxNamedColour(name)**

wxColour::Blue

unsigned char Blue() **const**

Returns the blue intensity.

wxColour::GetPixel

long GetPixel() **const**

Returns a pixel value which is platform-dependent. On Windows, a COLORREF is returned. On X, an allocated pixel value is returned.

-1 is returned if the pixel is invalid (on X, unallocated).

wxColour::Green

unsigned char Green() **const**

Returns the green intensity.

wxColour::Ok

bool Ok() **const**

Returns TRUE if the colour object is valid (the colour has been initialised with RGB values).

wxColour::Red

unsigned char Red() **const**

Returns the red intensity.

wxColour::Set

void Set(**const unsigned char** *red*, **const unsigned char** *green*, **const unsigned char** *blue*)

Sets the RGB intensity values.

wxColour::operator =

wxColour& operator =(**const wxColour&** *colour*)

Assignment operator, taking another colour object.

wxColour& operator =(**const wxString&** *colourName*)

Assignment operator, using a colour name to be found in the colour database.

See also

wxColourDatabase (p. 141)

wxColour::operator ==

bool operator ==(**const wxColour&** *colour*)

Tests the equality of two colours by comparing individual red, green blue colours.

wxColour::operator !=

bool operator !=(**const wxColour&** *colour*)

Tests the inequality of two colours by comparing individual red, green blue colours.

wxColourData

This class holds a variety of information related to colour dialogs.

Derived from

wxObject (p. 750)

Include files

<wx/cmndata.h>

See also

wxColour (p. 136), *wxColourDialog* (p. 142), *wxColourDialog overview* (p. 1407)

wxColourData::wxColourData

wxColourData()

Constructor. Initializes the custom colours to white, the *data colour* setting to black, and the *choose full* setting to TRUE.

wxColourData::~wxColourData

~wxColourData()

Destructor.

wxColourData::GetChooseFull

bool GetChooseFull() **const**

Under Windows, determines whether the Windows colour dialog will display the full dialog with custom colour selection controls. Has no meaning under other platforms.

The default value is TRUE.

wxColourData::GetColour

wxColour& GetColour() **const**

Gets the current colour associated with the colour dialog.

The default colour is black.

wxColourData::GetCustomColour

wxColour& GetCustomColour(**int** *i*) **const**

Gets the *i*th custom colour associated with the colour dialog. *i* should be an integer between 0 and 15.

The default custom colours are all white.

wxColourData::SetChooseFull

void SetChooseFull(**const bool** *flag*)

Under Windows, tells the Windows colour dialog to display the full dialog with custom colour selection controls. Under other platforms, has no effect.

The default value is TRUE.

wxColourData::SetColour

void SetColour(**const wxColour&** *colour*)

Sets the default colour for the colour dialog.

The default colour is black.

wxColourData::SetCustomColour

void SetCustomColour(**int** *i*, **const wxColour&** *colour*)

Sets the *i*th custom colour for the colour dialog. *i* should be an integer between 0 and 15.

The default custom colours are all white.

wxColourData::operator =

void operator =(**const wxColourData&** *data*)

Assingment operator for the colour data.

wxColourDatabase

wxWindows maintains a database of standard RGB colours for a predefined set of named colours (such as "BLACK", "LIGHT GREY"). The application may add to this set if desired by using *Append.* There is only one instance of this class: **wxTheColourDatabase** .

Derived from

wxList (p. 619)
wxObject (p. 750)

Include files

<wx/gdicmn.h>

Remarks

The colours in the standard database are as follows:

AQUAMARINE, BLACK, BLUE, BLUE VIOLET, BROWN, CADET BLUE, CORAL, CORNFLOWER BLUE, CYAN, DARK GREY, DARK GREEN, DARK OLIVE GREEN, DARK ORCHID, DARK SLATE BLUE, DARK SLATE GREY DARK TURQUOISE, DIM GREY, FIREBRICK, FOREST GREEN, GOLD, GOLDENROD, GREY, GREEN, GREEN YELLOW, INDIAN RED, KHAKI, LIGHT BLUE, LIGHT GREY, LIGHT STEEL BLUE, LIME GREEN, MAGENTA, MAROON, MEDIUM AQUAMARINE, MEDIUM BLUE, MEDIUM FOREST GREEN, MEDIUM GOLDENROD, MEDIUM ORCHID, MEDIUM SEA GREEN, MEDIUM SLATE BLUE, MEDIUM SPRING GREEN, MEDIUM TURQUOISE, MEDIUM VIOLET RED, MIDNIGHT BLUE, NAVY, ORANGE, ORANGE

RED, ORCHID, PALE GREEN, PINK, PLUM, PURPLE, RED, SALMON, SEA GREEN, SIENNA, SKY BLUE, SLATE BLUE, SPRING GREEN, STEEL BLUE, TAN, THISTLE, TURQUOISE, VIOLET, VIOLET RED, WHEAT, WHITE, YELLOW, YELLOW GREEN.

See also

wxColour (p. 136)

wxColourDatabase::wxColourDatabase

wxColourDatabase()

Constructs the colour database.

wxColourDatabase::FindColour

wxColour* FindColour(**const wxString&** *colourName*)

Finds a colour given the name. Returns NULL if not found.

wxColourDatabase::FindName

wxString FindName(**const wxColour&** *colour*) **const**

Finds a colour name given the colour. Returns NULL if not found.

wxColourDatabase::Initialize

void Initialize()

Initializes the database with a number of stock colours. Called by wxWindows on start-up.

wxColourDialog

This class represents the colour chooser dialog.

Derived from

wxDialog (p. 312)

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/colordlg.h>

See also

wxColourDialog Overview (p. 1407), *wxColour* (p. 136), *wxColourData* (p. 139)

wxColourDialog::wxColourDialog

wxColourDialog(**wxWindow*** *parent*, **wxColourData*** *data = NULL*)

Constructor. Pass a parent window, and optionally a pointer to a block of colour data, which will be copied to the colour dialog's colour data.

See also

wxColourData (p. 139)

wxColourDialog::~wxColourDialog

~wxColourDialog()

Destructor.

wxColourDialog::Create

bool Create (**wxWindow*** *parent*, **wxColourData*** *data = NULL*)

Same as *constructor* (p. 143).

wxColourDialog::GetColourData

wxColourData& GetColourData()

Returns the *colour data* (p. 139) associated with the colour dialog.

wxColourDialog::ShowModal

int ShowModal()

Shows the dialog, returning wxID_OK if the user pressed OK, and wxOK_CANCEL
otherwise.

wxComboBox

A combobox is like a combination of an edit control and a listbox. It can be displayed as
static list with editable or read-only text field; or a drop-down list with text field; or a drop-
down list without a text field.

A combobox permits a single selection only. Combobox items are numbered from zero.

Derived from

wxChoice (p. 113)
wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/combobox.h>

Window styles

wxCB_SIMPLE	Creates a combobox with a permanently displayed list. Windows only.
wxCB_DROPDOWN	Creates a combobox with a drop-down list.
wxCB_READONLY	Same as wxCB_DROPDOWN but only the strings specified as the combobox choices can be selected, it is impossible to select (even from a program) a string which is not in the choices list.
wxCB_SORT	Sorts the entries in the list alphabetically.

See also *window styles overview* (p. 1379).

Event handling

EVT_COMBOBOX(id, func)	Process a wxEVT_COMMAND_COMBOBOX_SELECTED event, when an item on the list is selected.
EVT_TEXT(id, func)	Process a wxEVT_COMMAND_TEXT_UPDATED event,

when the combobox text changes.

See also

wxListBox (p. 625), *wxTextCtrl* (p. 1075), *wxChoice* (p. 113), *wxCommandEvent* (p. 153)

wxComboBox::wxComboBox

wxComboBox()

Default constructor.

wxComboBox(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *value = ""*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **int** *n*, **const wxString** *choices[]*, **long** *style = 0*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "comboBox"*)

Constructor, creating and showing a combobox.

Parameters

parent
 Parent window. Must not be NULL.

id
 Window identifier. A value of -1 indicates a default value.

pos
 Window position.

size
 Window size. If the default size (-1, -1) is specified then the window is sized appropriately.

n
 Number of strings with which to initialise the control.

choices
 An array of strings with which to initialise the control.

style
 Window style. See *wxComboBox* (p. 144).

validator
 Window validator.

name

Window name.

See also

wxComboBox::Create (p. 146), *wxValidator* (p. 1172)

wxPython note: The wxComboBox constructor in wxPython reduces the `n` and `choices` arguments are to a single argument, which is a list of strings.

wxComboBox::~wxComboBox

~wxComboBox()

Destructor, destroying the combobox.

wxComboBox::Append

void Append(**const wxString&** *item*)

Adds the item to the end of the combobox.

void Append(**const wxString&** *item*, **void*** *clientData*)

Adds the item to the end of the combobox, associating the given data with the item.

Parameters

item
    The string to add.

clientData
    Client data to associate with the item.

wxComboBox::Clear

void Clear()

Clears all strings from the combobox.

wxComboBox::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *value = ""*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **int** *n*, **const wxString** *choices[]*, **long** *style = 0*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "comboBox"*)

Creates the combobox for two-step construction. Derived classes should call or replace this function. See *wxComboBox::wxComboBox* (p. 145) for further details.

wxComboBox::Copy

void Copy()

Copies the selected text to the clipboard.

wxComboBox::Cut

void Cut()

Copies the selected text to the clipboard and removes the selection.

wxComboBox::Delete

void Delete(**int** *n*)

Deletes an item from the combobox.

Parameters

n
    The item to delete, starting from zero.

wxComboBox::FindString

int FindString(**const wxString&** *string*)

Finds a choice matching the given string.

Parameters

string
    The item to find.

Return value

The position if found, or -1 if not found.

wxComboBox::GetClientData

void* GetClientData(**int** *n*) **const**

Returns a pointer to the client data associated with the given item (if any).

Parameters

n
 An item, starting from zero.

Return value

A pointer to the client data, or NULL if the item was not found.

wxComboBox::GetInsertionPoint

long GetInsertionPoint() const

Returns the insertion point for the combobox's text field.

wxComboBox::GetLastPosition

long GetLastPosition() const

Returns the last position in the combobox text field.

wxComboBox::GetSelection

int GetSelection() const

Gets the position of the selected string, or -1 if there is no selection.

wxComboBox::GetString

wxString GetString(int *n*) const

Returns the string at position *n*.

Parameters

n
 The item position, starting from zero.

Return value

The string if the item is found, otherwise the empty string.

wxComboBox::GetStringSelection

wxString GetStringSelection() const

Gets the selected string.

wxComboBox::GetValue

wxString GetValue() const

Returns the current value in the combobox text field.

wxComboBox::Number

int Number() const

Returns the number of items in the combobox list.

wxComboBox::Paste

void Paste()

Pastes text from the clipboard to the text field.

wxComboBox::Replace

void Replace(long *from*, long *to*, const wxString& *text*)

Replaces the text between two positions with the given text, in the combobox text field.

Parameters

from
    The first position.

to
    The second position.

text
    The text to insert.

wxComboBox::Remove

void Remove(long *from*, long *to*)

Removes the text between the two positions in the combobox text field.

Parameters

from
    The first position.

to
    The last position.

wxComboBox::SetClientData

void SetClientData(**int** *n*, **void*** *data*)

Associates the given client data pointer with the given item.

Parameters

n
    The zero-based item.

data
    The client data.

wxComboBox::SetInsertionPoint

void SetInsertionPoint(**long** *pos*)

Sets the insertion point in the combobox text field.

Parameters

pos
    The new insertion point.

wxComboBox::SetInsertionPointEnd

void SetInsertionPointEnd()

Sets the insertion point at the end of the combobox text field.

wxComboBox::SetSelection

void SetSelection(**int** *n*)

Selects the given item in the combobox list. This does not cause a
wxEVT_COMMAND_COMBOBOX_SELECTED event to get emitted.

void SetSelection(**long** *from*, **long** *to*)

Selects the text between the two positions, in the combobox text field.

Parameters

n
> The zero-based item to select.

from
> The first position.

to
> The second position.

wxPython note: The second form of this method is called `SetMark` in wxPython.

wxComboBox::SetValue

void SetValue(**const wxString&** *text*)

Sets the text for the combobox text field.

NB: For a combobox with `wxCB_READONLY` style the string must be in the combobox choices list, otherwise the call to SetValue() is ignored.

Parameters

text
> The text to set.

wxCommand

wxCommand is a base class for modelling an application command, which is an action usually performed by selecting a menu item, pressing a toolbar button or any other means provided by the application to change the data or view.

Derived from

wxObject (p. 750)

Include files

<wx/docview.h>

See also

Overview (p. 1415)

wxCommand::wxCommand

wxCommand(**bool** *canUndo = FALSE*, **const wxString&** *name = NULL*)

Constructor. wxCommand is an abstract class, so you will need to derive a new class and call this constructor from your own constructor.

canUndo tells the command processor whether this command is undo-able. You can achieve the same functionality by overriding the CanUndo member function (if for example the criteria for undoability is context-dependant).

name must be supplied for the command processor to display the command name in the application's edit menu.

wxCommand::~wxCommand

~wxCommand()

Destructor.

wxCommand::CanUndo

bool CanUndo()

Returns TRUE if the command can be undone, FALSE otherwise.

wxCommand::Do

bool Do()

Override this member function to execute the appropriate action when called. Return TRUE to indicate that the action has taken place, FALSE otherwise. Returning FALSE will indicate to the command processor that the action is not undoable and should not be added to the command history.

wxCommand::GetName

wxString GetName()

Returns the command name.

wxCommand::Undo

bool Undo()

Override this member function to un-execute a previous Do. Return TRUE to indicate that the action has taken place, FALSE otherwise. Returning FALSE will indicate to the command processor that the action is not redoable and no change should be made to the command history.

How you implement this command is totally application dependent, but typical strategies include:

- Perform an inverse operation on the last modified piece of data in the document. When redone, a copy of data stored in command is pasted back or some operation reapplied. This relies on the fact that you know the ordering of Undos; the user can never Undo at an arbitrary position in the command history.
- Restore the entire document state (perhaps using document transactioning). Potentially very inefficient, but possibly easier to code if the user interface and data are complex, and an 'inverse execute' operation is hard to write.

The docview sample uses the first method, to remove or restore segments in the drawing.

wxCommandEvent

This event class contains information about command events, which originate from a variety of simple controls. More complex controls, such as *wxTreeCtrl* (p. 1140), have separate command event classes.

Derived from

wxEvent (p. 377)

Include files

<wx/event.h>

Event table macros

To process a menu command event, use these event handler macros to direct input to member functions that take a wxCommandEvent argument.

EVT_COMMAND(id, event, func)	Process a command, supplying the window identifier, command event identifier, and member function.
EVT_COMMAND_RANGE(id1, id2, event, func)	Process a command for a range of

	window identifiers, supplying the minimum and maximum window identifiers, command event identifier, and member function.
EVT_BUTTON(id, func)	Process a wxEVT_COMMAND_BUTTON_CLICKED command, which is generated by a wxButton control.
EVT_CHECKBOX(id, func)	Process a wxEVT_COMMAND_CHECKBOX_CLICKED command, which is generated by a wxCheckBox control.
EVT_CHOICE(id, func)	Process a wxEVT_COMMAND_CHOICE_SELECTED command, which is generated by a wxChoice control.
EVT_LISTBOX(id, func)	Process a wxEVT_COMMAND_LISTBOX_SELECTED command, which is generated by a wxListBox control.
EVT_LISTBOX_DCLICK(id, func)	Process a wxEVT_COMMAND_LISTBOX_DOUBLECLIC KED command, which is generated by a wxListBox control.
EVT_TEXT(id, func)	Process a wxEVT_COMMAND_TEXT_UPDATED command, which is generated by a wxTextCtrl control.
EVT_TEXT_ENTER(id, func)	Process a wxEVT_COMMAND_TEXT_ENTER command, which is generated by a wxTextCtrl control. Note that you must use wxTE_PROCESS_ENTER flag when creating the control if you want it to generate such events.
EVT_MENU(id, func)	Process a wxEVT_COMMAND_MENU_SELECTED command, which is generated by a menu item.
EVT_MENU_RANGE(id1, id2, func)	Process a wxEVT_COMMAND_MENU_RANGE command, which is generated by a range of menu items.
EVT_SLIDER(id, func)	Process a wxEVT_COMMAND_SLIDER_UPDATED command, which is generated by a wxSlider control.
EVT_RADIOBOX(id, func)	Process a wxEVT_COMMAND_RADIOBOX_SELECTED command, which is generated by a wxRadioBox control.
EVT_RADIOBUTTON(id, func)	Process a wxEVT_COMMAND_RADIOBUTTON_SELEC TED command, which is generated by a

	wxRadioButton control.
EVT_SCROLLBAR(id, func)	Process a wxEVT_COMMAND_SCROLLBAR_UPDATED command, which is generated by a wxScrollBar control. This is provided for compatibility only; more specific scrollbar event macros should be used instead (see *wxScrollEvent* (p. 914)).
EVT_COMBOBOX(id, func)	Process a wxEVT_COMMAND_COMBOBOX_SELECTED command, which is generated by a wxComboBox control.
EVT_TOOL(id, func)	Process a wxEVT_COMMAND_TOOL_CLICKED event (a synonym for wxEVT_COMMAND_MENU_SELECTED). Pass the id of the tool.
EVT_TOOL_RANGE(id1, id2, func)	Process a wxEVT_COMMAND_TOOL_CLICKED event for a range id identifiers. Pass the ids of the tools.
EVT_TOOL_RCLICKED(id, func)	Process a wxEVT_COMMAND_TOOL_RCLICKED event. Pass the id of the tool.
EVT_TOOL_RCLICKED_RANGE(id1, id2, func)	Process a wxEVT_COMMAND_TOOL_RCLICKED event for a range of ids. Pass the ids of the tools.
EVT_TOOL_ENTER(id, func)	Process a wxEVT_COMMAND_TOOL_ENTER event. Pass the id of the toolbar itself. The value of wxCommandEvent::GetSelection is the tool id, or -1 if the mouse cursor has moved off a tool.
EVT_COMMAND_LEFT_CLICK(id, func)	Process a wxEVT_COMMAND_LEFT_CLICK command, which is generated by a control (Windows 95 and NT only).
EVT_COMMAND_LEFT_DCLICK(id, func)	Process a wxEVT_COMMAND_LEFT_DCLICK command, which is generated by a control (Windows 95 and NT only).
EVT_COMMAND_RIGHT_CLICK(id, func)	Process a wxEVT_COMMAND_RIGHT_CLICK command, which is generated by a control (Windows 95 and NT only).
EVT_COMMAND_SET_FOCUS(id, func)	Process a wxEVT_COMMAND_SET_FOCUS command, which is generated by a control (Windows 95 and NT only).
EVT_COMMAND_KILL_FOCUS(id, func)	Process a wxEVT_COMMAND_KILL_FOCUS command, which is generated by a control (Windows 95 and NT only).

EVT_COMMAND_ENTER(id, func)   Process a wxEVT_COMMAND_ENTER
                                        command, which is generated by a control.

wxCommandEvent::m_clientData

void* m_clientData

Contains a pointer to client data for listboxes and choices, if the event was a selection.
Beware, this is not implemented anyway...

wxCommandEvent::m_commandInt

int m_commandInt

Contains an integer identifier corresponding to a listbox, choice or radiobox selection
(only if the event was a selection, not a deselection), or a boolean value representing the
value of a checkbox.

wxCommandEvent::m_commandString

char* m_commandString

Contains a string corresponding to a listbox or choice selection.

wxCommandEvent::m_extraLong

long m_extraLong

Extra information. If the event comes from a listbox selection, it is a boolean determining
whether the event was a selection (TRUE) or a deselection (FALSE). A listbox
deselection only occurs for multiple-selection boxes, and in this case the index and
string values are indeterminate and the listbox must be examined by the application.

wxCommandEvent::wxCommandEvent

wxCommandEvent(**WXTYPE** *commandEventType = 0*, **int** *id = 0*)

Constructor.

wxCommandEvent::Checked

bool Checked() **const**

Deprecated, use *IsChecked* (p. 157) instead.

wxCommandEvent::GetClientData

void* GetClientData()

Returns client data pointer for a listbox or choice selection event (not valid for a deselection).

wxCommandEvent::GetExtraLong

long GetExtraLong()

Returns the **m_extraLong** member.

wxCommandEvent::GetInt

int GetInt()

Returns the **m_commandInt** member.

wxCommandEvent::GetSelection

int GetSelection()

Returns item index for a listbox or choice selection event (not valid for a deselection).

wxCommandEvent::GetString

char* GetString()

Returns item string for a listbox or choice selection event (not valid for a deselection).

wxCommandEvent::IsChecked

bool IsChecked() **const**

This method can be used with checkbox and menu events: for the checkboxes, the method returns TRUE for a selection event and FALSE for a deselection one. For the menu events, this method indicates if the menu item just has become checked or

unchecked (and thus only makes sense for checkable menu items).

wxCommandEvent::IsSelection

bool IsSelection()

For a listbox or choice event, returns TRUE if it is a selection, FALSE if it is a deselection.

wxCommandEvent::SetClientData

void SetClientData(**void*** *clientData*)

Sets the client data for this event.

wxCommandEvent::SetExtraLong

void SetExtraLong(**int** *extraLong*)

Sets the **m_extraLong** member.

wxCommandEvent::SetInt

void SetInt(**int** *intCommand*)

Sets the **m_commandInt** member.

wxCommandEvent::SetString

void SetString(**char*** *string*)

Sets the **m_commandString** member.

wxCommandProcessor

wxCommandProcessor is a class that maintains a history of wxCommands, with undo/redo functionality built-in. Derive a new class from this if you want different behaviour.

Derived from

wxObject (p. 750)

Include files

<wx/docview.h>

See also

wxCommandProcessor overview (p. 1415), *wxCommand* (p. 151)

wxCommandProcessor::wxCommandProcessor

wxCommandProcessor(**int** *maxCommands = 100*)

Constructor.

maxCommands defaults to a rather arbitrary 100, but can be set from 1 to any integer. If your wxCommand classes store a lot of data, you may wish the limit the number of commands stored to a smaller number.

wxCommandProcessor::~wxCommandProcessor

~wxCommandProcessor()

Destructor.

wxCommandProcessor::CanUndo

virtual bool CanUndo()

Returns TRUE if the currently-active command can be undone, FALSE otherwise.

wxCommandProcessor::ClearCommands

virtual void ClearCommands()

Deletes all the commands in the list and sets the current command pointer to NULL.

wxCommandProcessor::Do

virtual bool Do()

Executes (redoes) the current command (the command that has just been undone if

any).

wxCommandProcessor::GetCommands

wxList& GetCommands() **const**

Returns the list of commands.

wxCommandProcessor::GetMaxCommands

int GetMaxCommands() **const**

Returns the maximum number of commands that the command processor stores.

wxCommandProcessor::GetEditMenu

wxMenu* GetEditMenu() **const**

Returns the edit menu associated with the command processor.

wxCommandProcessor::Initialize

virtual void Initialize()

Initializes the command processor, setting the current command to the last in the list (if any), and updating the edit menu (if one has been specified).

wxCommandProcessor::SetEditMenu

void SetEditMenu(**wxMenu*** *menu*)

Tells the command processor to update the Undo and Redo items on this menu as appropriate. Set this to NULL if the menu is about to be destroyed and command operations may still be performed, or the command processor may try to access an invalid pointer.

wxCommandProcessor::Submit

virtual bool Submit(**wxCommand ****command*, **bool** *storeIt* = *TRUE*)

Submits a new command to the command processor. The command processor calls wxCommand::Do to execute the command; if it succeeds, the command is stored in the history list, and the associated edit menu (if any) updated appropriately. If it fails, the

command is deleted immediately. Once Submit has been called, the passed command should not be deleted directly by the application.

storeIt indicates whether the successful command should be stored in the history list.

wxCommandProcessor::Undo

virtual bool Undo()

Undoes the command just executed.

wxCondition

wxCondition variables correspond to pthread conditions or to Win32 event objects. They may be used in a multithreaded application to wait until the given condition becomes true which happens when the condition becomes signaled.

For example, if a worker thread is doing some long task and another thread has to wait until it is finished, the latter thread will wait on the condition object and the worker thread will signal it on exit (this example is not perfect because in this particular case it would be much better to just *Wait()* (p. 1113) for the worker thread, but if there are several worker threads it already makes much more sense).

Once the thread(s) are signaled, the condition then resets to the not signaled state, ready to fire again.

Derived from

None.

Include files

<wx/thread.h>

See also

wxThread (p. 1106), *wxMutex* (p. 735)

wxCondition::wxCondition

wxCondition()

Default constructor.

wxCondition::~wxCondition

 ~wxCondition()

Destroys the wxCondition object.

wxCondition::Broadcast

void Broadcast()

Broadcasts to all waiting objects.

wxCondition::Signal

void Signal()

Signals the object.

wxCondition::Wait

void Wait()

Waits indefinitely.

bool Wait(**unsigned long** *sec*, **unsigned long** *nsec*)

Waits until a signal is raised or the timeout has elapsed.

Parameters

sec
> Timeout in seconds

nsec
> Timeout nanoseconds component (added to *sec*).

Return value

The second form returns if the signal was raised, or FALSE if there was a timeout.

wxConfigBase

wxConfigBase class defines the basic interface of all config classes. It can not be used by itself (it is an abstract base class) and you will always use one of its derivations: wxIniConfig, wxFileConfig, wxRegConfig or any other.

However, usually you don't even need to know the precise nature of the class you're working with but you would just use the wxConfigBase methods. This allows you to write the same code regardless of whether you're working with the registry under Win32 or text-based config files under Unix (or even Windows 3.1 .INI files if you're really unlucky). To make writing the portable code even easier, wxWindows provides a typedef wxConfig which is mapped onto the native wxConfigBase implementation on the given platform: i.e. wxRegConfig under Win32, wxIniConfig under Win16 and wxFileConfig otherwise.

See *config overview* (p. 1366) for the descriptions of all features of this class.

It is highly recommended to use static functions *Get()* and/or *Set()*, so please have a *look at them.* (p. 164)

Derived from

No base class

Include files

<wx/config.h> (to let wxWindows choose a wxConfig class for your platform)
<wx/confbase.h> (base config class)
<wx/fileconf.h> (wxFileconfig class)
<wx/msw/regconf.h> (wxRegConfig class)
<wx/msw/iniconf.h> (wxIniConfig class)

Example

Here is how you would typically use this class:

```
  // using wxConfig instead of writing wxFileConfig or wxRegConfig
enhances
  // portability of the code
  wxConfig *config = new wxConfig("MyAppName");

  wxString str;
  if ( config->Read("LastPrompt", &str) ) {
    // last prompt was found in the config file/registry and its value
is now
    // in str
    ...
  }
  else {
    // no last prompt...
  }

  // another example: using default values and the full path instead of
just
```

```
    // key name: if the key is not found , the value 17 is returned
    long value = config->Read("/LastRun/CalculatedValues/MaxValue", -1);
    ...
    ...
    ...
    // at the end of the program we would save everything back
    config->Write("LastPrompt", str);
    config->Write("/LastRun/CalculatedValues/MaxValue", value);

    // the changes will be written back automatically
    delete config;
```

This basic example, of course, doesn't show all wxConfig features, such as enumerating, testing for existence and deleting the entries and groups of entries in the config file, its abilities to automatically store the default values or expand the environment variables on the fly. However, the main idea is that using this class is easy and that it should normally do what you expect it to.

NB: in the documentation of this class, the words "config file" also mean "registry hive" for wxRegConfig and, generally speaking, might mean any physical storage where a wxConfigBase-derived class stores its data.

Static functions

These functions deal with the "default" config object. Although its usage is not at all mandatory it may be convenient to use a global config object instead of creating and deleting the local config objects each time you need one (especially because creating a wxFileConfig object might be a time consuming operation). In this case, you may create this global config object in the very start of the program and *Set()* it as the default. Then, from anywhere in your program, you may access it using the *Get()* function. Of course, you should delete it on the program termination (otherwise, not only a memory leak will result, but even more importantly the changes won't be written back!).

As it happens, you may even further simplify the procedure described above: you may forget about calling *Set()*. When *Get()* is called and there is no current object, it will create one using *Create()* function. To disable this behaviour *DontCreateOnDemand()* is provided.

Note: You should use either *Set()* or *Get()* because wxWindows library itself would take advantage of it and could save various information in it. For example *wxFontMapper* (p. 451) or Unix version of *wxFileDialog* (p. 410) have ability to use wxConfig class.

Set (p. 175)
Get (p. 171)
Create (p. 170)
DontCreateOnDemand (p. 170)

Constructor and destructor

Path management

As explained in *config overview* (p. 1366), the config classes support a file system-like hierarchy of keys (files) and groups (directories). As in the file system case, to specify a key in the config class you must use a path to it. Config classes also support the notion of the current group, which makes it possible to use the relative paths. To clarify all this, here is an example (it is only for the sake of demonstration, it doesn't do anything sensible!):

```
wxConfig *config = new wxConfig("FooBarApp");

// right now the current path is '/'
conf->Write("RootEntry", 1);

// go to some other place: if the group(s) don't exist, they will be
created
conf->SetPath("/Group/Subgroup");

// create an entry in subgroup
conf->Write("SubgroupEntry", 3);

// '..' is understood
conf->Write("../GroupEntry", 2);
conf->SetPath("..");

wxASSERT( conf->Read("Subgroup/SubgroupEntry", 0l) == 3 );

// use absolute path: it is allowed, too
wxASSERT( conf->Read("/RootEntry", 0l) == 1 );
```

Warning: it is probably a good idea to always restore the path to its old value on function exit:

```
void foo(wxConfigBase *config)
{
  wxString strOldPath = config->GetPath();

  config->SetPath("/Foo/Data");
  ...

  config->SetPath(strOldPath);
}
```

because otherwise the assert in the following example will surely fail (we suppose here that *foo()* function is the same as above except that it doesn't save and restore the path):

```
void bar(wxConfigBase *config)
{
  config->Write("Test", 17);
```

```
    foo(config);

    // we're reading "/Foo/Data/Test" here! -1 will probably be
returned...
    wxASSERT( config->Read("Test", -1) == 17 );
  }
```

Finally, the path separator in wxConfigBase and derived classes is always '/', regardless of the platform (i.e. it is **not** '\\' under Windows).

SetPath (p. 176)
GetPath (p. 173)

Enumeration

The functions in this section allow to enumerate all entries and groups in the config file. All functions here return FALSE when there are no more items.

You must pass the same index to GetNext and GetFirst (don't modify it). Please note that it is **not** the index of the current item (you will have some great surprizes with wxRegConfig if you assume this) and you shouldn't even look at it: it is just a "cookie" which stores the state of the enumeration. It can't be stored inside the class because it would prevent you from running several enumerations simultaneously, that's why you must pass it explicitly.

Having said all this, enumerating the config entries/groups is very simple:

```
  wxArrayString aNames;

  // enumeration variables
  wxString str;
  long dummy;

  // first enum all entries
  bool bCont = config->GetFirstEntry(str, dummy);
  while ( bCont ) {
    aNames.Add(str);

    bCont = GetConfig()->GetNextEntry(str, dummy);
  }

  ... we have all entry names in aNames...

  // now all groups...
  bCont = GetConfig()->GetFirstGroup(str, dummy);
  while ( bCont ) {
    aNames.Add(str);

    bCont = GetConfig()->GetNextGroup(str, dummy);
  }

  ... we have all group (and entry) names in aNames...
```

There are also functions to get the number of entries/subgroups without actually enumerating them, but you will probably never need them.

GetFirstGroup (p. 172)
GetNextGroup (p. 172)
GetFirstEntry (p. 172)
GetNextEntry (p. 172)
GetNumberOfEntries (p. 172)
GetNumberOfGroups (p. 172)

Tests of existence

HasGroup (p. 173)
HasEntry (p. 173)
Exists (p. 171)
GetEntryType (p. 171)

Miscellaneous functions

GetAppName (p. 171)
GetVendorName (p. 173)
SetUmask (p. 176)

Key access

These function are the core of wxConfigBase class: they allow you to read and write config file data. All *Read* function take a default value which will be returned if the specified key is not found in the config file.

Currently, only two types of data are supported: string and long (but it might change in the near future). To work with other types: for *int* or *bool* you can work with function taking/returning *long* and just use the casts. Better yet, just use *long* for all variables which you're going to save in the config file: chances are that `sizeof(bool) == sizeof(int) == sizeof(long)` anyhow on your system. For *float*, *double* and, in general, any other type you'd have to translate them to/from string representation and use string functions.

Try not to read long values into string variables and vice versa: although it just might work with wxFileConfig, you will get a system error with wxRegConfig because in the Windows registry the different types of entries are indeed used.

Final remark: the *szKey* parameter for all these functions can contain an arbitrary path (either relative or absolute), not just the key name.

Read (p. 173)

Rename entries/groups

The functions in this section allow to rename entries or subgroups of the current group. They will return FALSE on error. typically because either the entry/group with the original name doesn't exist, because the entry/group with the new name already exists or because the function is not supported in this wxConfig implementation.

Delete entries/groups

The functions in this section delete entries and/or groups of entries from the config file. *DeleteAll()* is especially useful if you want to erase all traces of your program presence: for example, when you uninstall it.

Options

Some aspects of wxConfigBase behaviour can be changed during run-time. The first of them is the expansion of environment variables in the string values read from the config file: for example, if you have the following in your config file:

```
# config file for my program
UserData = $HOME/data

# the following syntax is valud only under Windows
UserData = %windir%\\data.dat
```

the call to `config->Read("UserData")` will return something like `"/home/zeitlin/data"` if you're lucky enough to run a Linux system ;-)

Although this feature is very useful, it may be annoying if you read a value which containts '$' or '%' symbols (% is used for environment variables expansion under Windows) which are not used for environment variable expansion. In this situation you may call SetExpandEnvVars(FALSE) just before reading this value and SetExpandEnvVars(TRUE) just after. Another solution would be to prefix the offending symbols with a backslash.

The following functions control this option:

wxConfigBase::wxConfigBase

wxConfigBase(**const wxString&** *appName = wxEmptyString*, **const wxString&** *vendorName = wxEmptyString*, **const wxString&** *localFilename = wxEmptyString*, **const wxString&** *globalFilename = wxEmptyString*, **long** *style = 0*)

This is the default and only constructor of the wxConfigBase class, and derived classes.

Parameters

appName
> The application name. If this is empty, the class will normally use *wxApp::GetAppName* (p. 23) to set it. The application name is used in the registry key on Windows, and can be used to deduce the local filename parameter if that is missing.

vendorName
> The vendor name. If this is empty, it is assumed that no vendor name is wanted, if this is optional for the current config class. The vendor name is appended to the application name for wxRegConfig.

localFilename
> Some config classes require a local filename. If this is not present, but required, the application name will be used instead.

globalFilename
> Some config classes require a global filename. If this is not present, but required, the application name will be used instead.

style
> Can be one of wxCONFIG_USE_LOCAL_FILE and wxCONFIG_USE_GLOBAL_FILE. The style interpretation depends on the config class and is ignored by some. For wxFileConfig, these styles determine whether a local or global config file is created or used. If the flag is present but the parameter is empty, the parameter will be set to a default. If the parameter is present but the style flag not, the relevant flag will be added to the style. For wxFileConfig you can also add wxCONFIG_USE_RELATIVE_PATH by logicaly or'ing it to either of the _FILE options to tell wxFileConfig to use relative instead of absolute paths.

Remarks

By default, environment variable expansion is on and recording defaults is off.

wxConfigBase::~wxConfigBase

~wxConfigBase()

Empty but ensures that dtor of all derived classes is virtual.

wxConfigBase::Create

static wxConfigBase * Create()

Create a new config object: this function will create the "best" implementation of wxConfig available for the current platform, see comments near the definition of wxCONFIG_WIN32_NATIVE for details. It returns the created object and also sets it as the current one.

wxConfigBase::DontCreateOnDemand

void DontCreateOnDemand()

Calling this function will prevent *Get()* from automatically creating a new config object if the current one is NULL. It might be useful to call it near the program end to prevent new config object "accidental" creation.

wxConfigBase::DeleteAll

bool DeleteAll()

Delete the whole underlying object (disk file, registry key, ...). Primarly for use by desinstallation routine.

wxConfigBase::DeleteEntry

bool DeleteEntry(const wxString& *key*, **bool** *bDeleteGroupIfEmpty = TRUE*)

Deletes the specified entry and the group it belongs to if it was the last key in it and the second parameter is true.

wxConfigBase::DeleteGroup

bool Delete Group(**const wxString&** *key*)

Delete the group (with all subgroups)

wxConfigBase::Exists

bool Exists(**wxString&** *strName*) **const**

returns TRUE if either a group or an entry with a given name exists

wxConfigBase::Flush

bool Flush(**bool** *bCurrentOnly = FALSE*)

permanently writes all changes (otherwise, they're only written from object's destructor)

wxConfigBase::Get

wxConfigBase * Get(**bool** *CreateOnDemand = TRUE*)

Get the current config object. If there is no current object and*CreateOnDemand* is TRUE, creates one (using *Create*) unless DontCreateOnDemand was called previously.

wxConfigBase::GetAppName

wxString GetAppName() **const**

Returns the application name.

wxConfigBase::GetEntryType

enum wxConfigBase::EntryType GetEntryType(**const wxString&** *name*) **const**

Returns the type of the given entry or *Unknown* if the entry doesn't exist. This function should be used to decide which version of Read() should be used because some of wxConfig implementations will complain about type mismatch otherwise: e.g., an attempt to read a string value from an integer key with wxRegConfig will fail.

The result is an element of enum EntryType:

```
enum EntryType
{
  Unknown,
  String,
  Boolean,
  Integer,
  Float
};
```

wxConfigBase::GetFirstGroup

bool GetFirstGroup(**wxString&** *str*, **long&** *index*) **const**

Gets the first group.

wxPython note: The wxPython version of this method returns a 3-tuple consisting of the continue flag, the value string, and the index for the next call.

wxConfigBase::GetFirstEntry

bool GetFirstEntry(**wxString&** *str*, **long&** *index*) **const**

Gets the first entry.

wxPython note: The wxPython version of this method returns a 3-tuple consisting of the continue flag, the value string, and the index for the next call.

wxConfigBase::GetNextGroup

bool GetNextGroup(**wxString&** *str*, **long&** *index*) **const**

Gets the next group.

wxPython note: The wxPython version of this method returns a 3-tuple consisting of the continue flag, the value string, and the index for the next call.

wxConfigBase::GetNextEntry

bool GetNextEntry(**wxString&** *str*, **long&** *index*) **const**

Gets the next entry.

wxPython note: The wxPython version of this method returns a 3-tuple consisting of the continue flag, the value string, and the index for the next call.

wxConfigBase::GetNumberOfEntries

uint GetNumberOfEntries(**bool** *bRecursive = FALSE*) **const**

wxConfigBase::GetNumberOfGroups

uint GetNumberOfGroups(**bool** *bRecursive = FALSE*) **const**

Get number of entries/subgroups in the current group, with or without its subgroups.

wxConfigBase::GetPath

const wxString& GetPath() **const**

Retrieve the current path (always as absolute path).

wxConfigBase::GetVendorName

wxString GetVendorName() **const**

Returns the vendor name.

wxConfigBase::HasEntry

bool HasEntry(**wxString&** *strName*) **const**

returns TRUE if the entry by this name exists

wxConfigBase::HasGroup

bool HasGroup(**const wxString&** *strName*) **const**

returns TRUE if the group by this name exists

wxConfigBase::IsExpandingEnvVars

bool IsExpandingEnvVars() **const**

Returns TRUE if we are expanding environment variables in key values.

wxConfigBase::IsRecordingDefaults

bool IsRecordingDefaults() **const**

Returns TRUE if we are writing defaults back to the config file.

wxConfigBase::Read

bool Read(**const wxString&** *key*, **wxString*** *str*) **const**

Read a string from the key, returning TRUE if the value was read. If the key was not found, *str* is not changed.

bool Read(**const wxString&** *key*, **wxString*** *str*, **const wxString&** *defaultVal*) **const**

Read a string from the key. The default value is returned if the key was not found.

Returns TRUE if value was really read, FALSE if the default was used.

wxString Read(**const wxString&** *key*, **const wxString&** *defaultVal*) **const**

Another version of *Read()*, returning the string value directly.

bool Read(**const wxString&** *key*, **long*** *l*) **const**

Reads a long value, returning TRUE if the value was found. If the value was not found, *l* is not changed.

bool Read(**const wxString&** *key*, **long*** *l*,**long** *defaultVal*) **const**

Reads a long value, returning TRUE if the value was found. If the value was not found, *defaultVal* is used instead.

long Read(**const wxString&** *key*, **long** *defaultVal*) **const**

Reads a long value from the key and returns it. *defaultVal* is returned if the key is not found.

NB: writing

```
 conf->Read("key", 0);
```

won't work because the call is ambiguous: compiler can not choose between two*Read* functions. Instead, write:

```
 conf->Read("key", 0l);
```

bool Read(**const wxString&** *key*, **double*** *d*) **const**

Reads a double value, returning TRUE if the value was found. If the value was not found, *d* is not changed.

bool Read(**const wxString&** *key*, **double*** *d*, **double** *defaultVal*) **const**

Reads a double value, returning TRUE if the value was found. If the value was not found, *defaultVal* is used instead.

bool Read(**const wxString&** *key*, **bool*** *b*) **const**

Reads a bool value, returning TRUE if the value was found. If the value was not found, *b* is not changed.

bool Read(**const wxString&** *key*, **bool*** *d*,**bool** *defaultVal*) **const**

Reads a bool value, returning TRUE if the value was found. If the value was not found, *defaultVal* is used instead.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

Read(key, default="")	Returns a string.
ReadInt(key, default=0)	Returns an int.
ReadFloat(key, default=0.0)	Returns a floating point number.

wxConfigBase::RenameEntry

bool RenameEntry(**const wxString&** *oldName*, **const wxString&** *newName*)

Renames an entry in the current group. The entries names (both the old and the new one) shouldn't contain backslashes, i.e. only simple names and not arbitrary paths are accepted by this function.

Returns FALSE if the *oldName* doesn't exist or if *newName* already exists.

wxConfigBase::RenameGroup

bool RenameGroup(**const wxString&** *oldName*, **const wxString&** *newName*)

Renames a subgroup of the current group. The subgroup names (both the old and the new one) shouldn't contain backslashes, i.e. only simple names and not arbitrary paths are accepted by this function.

Returns FALSE if the *oldName* doesn't exist or if *newName* already exists.

wxConfigBase::Set

wxConfigBase * Set(**wxConfigBase ****pConfig*)

Sets the config object as the current one, returns the pointer to the previous current object (both the parameter and returned value may be NULL)

wxConfigBase::SetExpandEnvVars

void SetExpandEnvVars (**bool** *bDoIt = TRUE*)

Determine whether we wish to expand environment variables in key values.

wxConfigBase::SetPath

void SetPath(**const wxString&** *strPath*)

Set current path: if the first character is '/', it is the absolute path, otherwise it is a relative path. '..' is supported. If the strPath doesn't exist it is created.

wxConfigBase::SetRecordDefaults

void SetRecordDefaults(**bool** *bDoIt = TRUE*)

Sets whether defaults are written back to the config file.

If on (default is off) all default values are written back to the config file. This allows the user to see what config options may be changed and is probably useful only for wxFileConfig.

wxConfigBase::SetUmask

void SetUmask(**int** *mode*)

NB: this function is not in the base wxConfigBase class but is only implemented in wxFileConfig. Moreover, this function is Unix-specific and doesn't do anything on other platforms.

SetUmask() allows to set the mode to be used for the config file creation. For example, to create a config file which is not readable by other users (useful if it stores some sensitive information, such as passwords), you should do SetUmask(0077).

wxConfigBase::Write

bool Write(**const wxString&** *key*, **const wxString&** *value*)

bool Write(**const wxString&** *key*, **long** *value*)

bool Write(**const wxString&** *key*, **double** *value*)

bool Write(**const wxString&** *key*, **bool** *value*)

These functions write the specified value to the config file and return TRUE on success.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

Write(key, value)	Writes a string.
WriteInt(key, value)	Writes an int.
WriteFloat(key, value)	Writes a floating point number.

wxControl

This is the base class for a control or 'widget'.

A control is generally a small window which processes user input and/or displays one or more item of data.

Derived from

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/control.h>

See also

wxValidator (p. 1172)

wxControl::Command

void Command(**wxCommandEvent&** *event*)

Simulates the effect of the user issuing a command to the item. See *wxCommandEvent* (p. 153).

wxControl::GetLabel

wxString& GetLabel()

Returns the control's text.

wxControl::SetLabel

void SetLabel(**const wxString&** *label*)

Sets the item's text.

wxCountingOutputStream

wxCountingOutputStream is a specialized output stream which does not write any data anyway, instead it counts how many bytes would get written if this were a normal stream. This can sometimes be useful or required if some data gets serialized to a stream or compressed by using stream compression and thus the final size of the stream cannot be known other than pretending to write the stream. One case where the resulting size would have to be known is if the data has to be written to a piece of memory and the memory has to be allocated before writing to it (which is probably always the case when writing to a memory stream).

Derived from

wxOutputStream (p. 755) *wxStreamBase* (p. 1003)

Include files

<wx/stream.h>

wxCountingOutputStream::wxCountingOutputStream

wxCountingOutputStream()

Creates a wxCountingOutputStream object.

wxCountingOutputStream::~wxCountingOutputStream

~wxCountingOutputStream()

Destructor.

wxCountingOutputStream::GetSize

size_t GetSize() **const**

Returns the current size of the stream.

wxCriticalSection

A critical section object is used for the same exactly purpose as *mutexes* (p. 735). The only difference is that under Windows platform critical sections are only visible inside one process, while mutexes may be shared between processes, so using critical sections is slightly more efficient. The terminology is also slightly different: mutex may be locked (or acquired) and unlocked (or released) while critical section is entered and left by the program.

Finally, you should try to use *wxCriticalSectionLocker* (p. 180) class whenever possible instead of directly using wxCriticalSection for the same reasons *wxMutexLocker* (p. 737) is preferrable to *wxMutex* (p. 735) - please see wxMutex for an example.

Derived from

None.

Include files

<wx/thread.h>

See also

wxThread (p. 1106), *wxCondition* (p. 161), *wxMutexLocker* (p. 737), *wxCriticalSection* (p. 179)

wxCriticalSection::wxCriticalSection

wxCriticalSection()

Default constructor initializes critical section object.

wxCriticalSection::~wxCriticalSection

~wxCriticalSection()

Destructor frees the ressources.

wxCriticalSection::Enter

void Enter()

Enter the critical section (same as locking a mutex). There is no error return for this

function. After entering the critical section protecting some global data the thread running in critical section may safely use/modify it.

wxCriticalSection::Leave

void Leave()

Leave the critical section allowing other threads use the global data protected by it. There is no error return for this function.

wxCriticalSectionLocker

This is a small helper class to be used with *wxCriticalSection* (p. 179) objects. A wxCriticalSectionLocker enters the critical section in the constructor and leaves it in the destructor making it much more difficult to forget to leave a critical section (which, in general, will lead to serious and difficult to debug problems).

Example of using it:

```
void SetFoo()
{
    // gs_critSect is some (global) critical section guarding access to
the
    // object "foo"
    wxCriticalSectionLocker locker(gs_critSect);

    if ( ... )
    {
        // do something
        ...

        return;
    }

    // do something else
    ...

    return;
}
```

Without wxCriticalSectionLocker, you would need to remember to manually leave the critical section before each `return`.

Derived from

None.

Include files

<wx/thread.h>

See also

wxCriticalSection (p. 179), *wxMutexLocker* (p. 737)

wxCriticalSectionLocker::wxCriticalSectionLocker

wxCriticalSectionLocker(**wxCriticalSection&** *criticalsection*)

Constructs a wxCriticalSectionLocker object associated with given*criticalsection* and enters it.

wxCriticalSectionLocker::~wxCriticalSectionLocker

~wxCriticalSectionLocker()

Destuctor leaves the critical section.

wxCSConv

This class converts between any character sets and Unicode. It has one predefined instance, **wxConvLocal**, for the default user character set.

Derived from

wxMBConv (p. 665)

Include files

<wx/strconv.h>

See also

wxMBConv (p. 665), *wxEncodingConverter* (p. 373), *wxMBConv classes overview* (p. 1350)

wxCSConv::wxCSConv

wxCSConv(**const wxChar*** *charset*)

Constructor. Specify the name of the character set you want to convert from/to.

wxCSConv::~wxCSConv

~wxCSConv()

Destructor.

wxCSConv::LoadNow

void LoadNow()

If the conversion tables needs to be loaded from disk, this method will do so. Otherwise, they will be loaded when any of the conversion methods are called.

wxCSConv::MB2WC

size_t MB2WC(**wchar_t*** *buf*, **const char*** *psz*, **size_t** *n*) **const**

Converts from the selected character set to Unicode. Returns the size of the destination buffer.

wxCSConv::WC2MB

size_t WC2MB(**char*** *buf*, **const wchar_t*** *psz*, **size_t** *n*) **const**

Converts from Unicode to the selected character set. Returns the size of the destination buffer.

wxCustomDataObject

wxCustomDataObject is a specialization of *wxDataObjectSimple* (p. 202) for some application-specific data in arbitrary (either custom or one of the standard ones). The only restriction is that it is supposed that this data can be copied bitwise (i.e. with `memcpy()`), so it would be a bad idea to make it contain a C++ object (though C struct is fine).

By default, wxCustomDataObject stores the data inside in a buffer. To put the data into the buffer you may use either *SetData* (p. 184) or *TakeData* (p. 184) depending on whether you want the object to make a copy of data or not.

If you already store the data in another place, it may be more convenient and efficient to provide the data on-demand which is possible too if you override the virtual functions mentioned below.

Virtual functions to override

This class may be used as is, but if you don't want store the data inside the object but provide it on demand instead, you should override *GetSize* (p. 184), *GetData* (p. 184) and *SetData* (p. 184) (or may be only the first two or only the last one if you only allow reading/writing the data)

Derived from

wxDataObjectSimple (p. 202)
wxDataObject (p. 197)

Include files

<wx/dataobj.h>

See also

wxDataObject (p. 197)

wxCustomDataObject::wxCustomDataObject

wxCustomDataObject(**const wxDataFormat&** *format = wxFormatInvalid*)

The constructor accepts a *format* argument which specifies the (single) format supported by this object. If it isn't set here, *SetFormat* (p. 203) should be used.

wxCustomDataObject::~wxCustomDataObject

~wxCustomDataObject()

The destructor will free the data hold by the object. Notice that although it calls a virtual *Free()* (p. 184) function, the base class version will always be called (C++ doesn't allow calling virtual functions from constructors or destructors), so if you override Free(), you should override the destructor in your class as well (which would probably just call the derived class' version of Free()).

wxCustomDataObject::Alloc

virtual void * Alloc(**size_t** *size*)

This function is called to allocate *size* bytes of memory from SetData(). The default version just uses the operator new.

wxCustomDataObject::Free

wxPython note: This method expects a string in wxPython. You can pass nearly any object by pickling it first.

virtual void Free()

This function is called when the data is freed, you may override it to anything you want (or may be nothing at all). The default version calls operator delete[] on the data.

wxCustomDataObject::GetSize

virtual size_t GetSize() **const**

Returns the data size in bytes.

wxCustomDataObject::GetData

virtual void * GetData() **const**

Returns a pointer to the data.

wxCustomDataObject::SetData

virtual void SetData(**size_t** *size*, **const void** **data*)

Set the data. The data object will make an internal copy.

wxCustomDataObject::TakeData

virtual void TakeData(**size_t** *size*, **const void** **data*)

Like *SetData* (p. 184), but doesn't copy the data - instead the object takes ownership of the pointer.

wxCursor

A cursor is a small bitmap usually used for denoting where the mouse pointer is, with a picture that might indicate the interpretation of a mouse click. As with icons, cursors in X and MS Windows are created in a different manner. Therefore, separate cursors will be created for the different environments. Platform-specific methods for creating a **wxCursor** object are catered for, and this is an occasion where conditional compilation will probably be required (see *wxIcon* (p. 562) for an example).

A single cursor object may be used in many windows (any subwindow type). The wxWindows convention is to set the cursor for a window, as in X, rather than to set it globally as in MS Windows, although a global *::wxSetCursor* (p. 1269) is also available for MS Windows use.

Derived from

wxBitmap (p. 54)
wxGDIObject (p. 477)
wxObject (p. 750)

Include files

<wx/cursor.h>

Predefined objects

Objects:

wxNullCursor

Pointers:

wxSTANDARD_CURSOR
wxHOURGLASS_CURSOR
wxCROSS_CURSOR

See also

wxBitmap (p. 54), *wxIcon* (p. 562), *wxWindow::SetCursor* (p. 1229), *::wxSetCursor* (p. 1269)

wxCursor::wxCursor

wxCursor()

Default constructor.

wxCursor(**const char** *bits[]*, **int** *width*, **int** *height*, **int** *hotSpotX=-1*, **int** *hotSpotY=-1*, **const char** *maskBits[]=NULL*)

Constructs a cursor by passing an array of bits (Motif and Xt only). *maskBits* is used only under Motif.

If either *hotSpotX* or *hotSpotY* is -1, the hotspot will be the centre of the cursor image (Motif only).

 wxCursor(**const wxString&** *cursorName*, **long** *type*, **int** *hotSpotX=0*, **int** *hotSpotY=0*)

Constructs a cursor by passing a string resource name or filename.

hotSpotX and *hotSpotY* are currently only used under Windows when loading from an icon file, to specify the cursor hotspot relative to the top left of the image.

 wxCursor(**int** *cursorId*)

Constructs a cursor using a cursor identifier.

 wxCursor(**const wxCursor&** *cursor*)

Copy constructor. This uses reference counting so is a cheap operation.

Parameters

bits
    An array of bits.

maskBits
    Bits for a mask bitmap.

width
    Cursor width.

height
    Cursor height.

hotSpotX
    Hotspot x coordinate.

hotSpotY
    Hotspot y coordinate.

type
    Icon type to load. Under Motif, *type* defaults to **wxBITMAP_TYPE_XBM**. Under Windows, it defaults to **wxBITMAP_TYPE_CUR_RESOURCE**.

    Under X, the permitted cursor types are:

    wxBITMAP_TYPE_XBM   Load an X bitmap file.

    Under Windows, the permitted types are:

wxBITMAP_TYPE_CUR	Load a cursor from a .cur cursor file (only if USE_RESOURCE_LOADING_IN_MSW is enabled in setup.h).
wxBITMAP_TYPE_CUR_RESOURCE	Load a Windows resource (as specified in the .rc file).
wxBITMAP_TYPE_ICO	Load a cursor from a .ico icon file (only if USE_RESOURCE_LOADING_IN_MSW is enabled in setup.h). Specify *hotSpotX* and *hotSpotY*.

cursorId

A stock cursor identifier. May be one of:

wxCURSOR_ARROW	A standard arrow cursor.
wxCURSOR_BULLSEYE	Bullseye cursor.
wxCURSOR_CHAR	Rectangular character cursor.
wxCURSOR_CROSS	A cross cursor.
wxCURSOR_HAND	A hand cursor.
wxCURSOR_IBEAM	An I-beam cursor (vertical line).
wxCURSOR_LEFT_BUTTON	Represents a mouse with the left button depressed.
wxCURSOR_MAGNIFIER	A magnifier icon.
wxCURSOR_MIDDLE_BUTTON	Represents a mouse with the middle button depressed.
wxCURSOR_NO_ENTRY	A no-entry sign cursor.
wxCURSOR_PAINT_BRUSH	A paintbrush cursor.
wxCURSOR_PENCIL	A pencil cursor.
wxCURSOR_POINT_LEFT	A cursor that points left.
wxCURSOR_POINT_RIGHT	A cursor that points right.
wxCURSOR_QUESTION_ARROW	An arrow and question mark.
wxCURSOR_RIGHT_BUTTON	Represents a mouse with the right button depressed.
wxCURSOR_SIZENESW	A sizing cursor pointing NE-SW.
wxCURSOR_SIZENS	A sizing cursor pointing N-S.
wxCURSOR_SIZENWSE	A sizing cursor pointing NW-SE.
wxCURSOR_SIZEWE	A sizing cursor pointing W-E.
wxCURSOR_SIZING	A general sizing cursor.
wxCURSOR_SPRAYCAN	A spraycan cursor.
wxCURSOR_WAIT	A wait cursor.
wxCURSOR_WATCH	A watch cursor.

Note that not all cursors are available on all platforms.

cursor

Pointer or reference to a cursor to copy.

wxPython note: Constructors supported by wxPython are:

> **wxCursor(name, flags, hotSpotX=0, hotSpotY=0)**   Constructs a cursor

from a filename
wxStockCursor(id)   Constructs a stock cursor

wxCursor::~wxCursor

~wxCursor()

Destroys the cursor. A cursor can be reused for more than one window, and does not get destroyed when the window is destroyed. wxWindows destroys all cursors on application exit, although it is best to clean them up explicitly.

wxCursor::Ok

bool Ok() **const**

Returns TRUE if cursor data is present.

wxCursor::operator =

wxCursor& operator =(**const wxCursor&** *cursor*)

Assignment operator, using reference counting. Returns a reference to 'this'.

wxCursor::operator ==

bool operator ==(**const wxCursor&** *cursor*)

Equality operator. Two cursors are equal if they contain pointers to the same underlying cursor data. It does not compare each attribute, so two independently-created cursors using the same parameters will fail the test.

wxCursor::operator !=

bool operator !=(**const wxCursor&** *cursor*)

Inequality operator. Two cursors are not equal if they contain pointers to different underlying cursor data. It does not compare each attribute.

wxDatabase

Every database object represents an ODBC connection. The connection may be closed and reopened.

Derived from

wxObject (p. 750)

Include files

<wx/odbc.h>

See also

wxDatabase overview (p. 1434), *wxRecordSet* (p. 877)

A much more robust and feature-rich set of ODBC classes is now available and recommended for use in place of the wxDatabase class.

See details of these classes in: *wxDB* (p. 244), *wxDbTable* (p. 268)

wxDatabase::wxDatabase

wxDatabase()

Constructor. The constructor of the first wxDatabase instance of an application initializes the ODBC manager.

wxDatabase::~wxDatabase

~wxDatabase()

Destructor. Resets and destroys any associated wxRecordSet instances.

The destructor of the last wxDatabase instance will deinitialize the ODBC manager.

wxDatabase::BeginTrans

bool BeginTrans()

Not implemented.

wxDatabase::Cancel

void Cancel()

Not implemented.

wxDatabase::CanTransact

bool CanTransact()

Not implemented.

wxDatabase::CanUpdate

bool CanUpdate()

Not implemented.

wxDatabase::Close

bool Close()

Resets the statement handles of any associated wxRecordSet objects, and disconnects from the current data source.

wxDatabase::CommitTrans

bool CommitTrans()

Commits previous transactions. Not implemented.

wxDatabase::ErrorOccured

bool ErrorOccured()

Returns TRUE if the last action caused an error.

wxDatabase::ErrorSnapshot

void ErrorSnapshot(**HSTMT** *statement = SQL_NULL_HSTMT*)

This function will be called whenever an ODBC error occured. It stores the error related information returned by ODBC. If a statement handle of the concerning ODBC action is available it should be passed to the function.

wxDatabase::GetDatabaseName

wxString GetDatabaseName ()

Returns the name of the database associated with the current connection.

wxDatabase::GetDataSource

wxString GetDataSource ()

Returns the name of the connected data source.

wxDatabase::GetErrorClass

wxString GetErrorClass ()

Returns the error class of the last error. The error class consists of five characters where the first two characters contain the class and the other three characters contain the subclass of the ODBC error. See ODBC documentation for further details.

wxDatabase::GetErrorCode

wxRETCODE GetErrorCode ()

Returns the error code of the last ODBC function call. This will be one of:

SQL_ERROR	General error.
SQL_INVALID_HANDLE	An invalid handle was passed to an ODBC function.
SQL_NEED_DATA	ODBC expected some data.
SQL_NO_DATA_FOUND	No data was found by this ODBC call.
SQL_SUCCESS	The call was successful.
SQL_SUCCESS_WITH_INFO	The call was successful, but further information can be obtained from the ODBC manager.

wxDatabase::GetErrorMessage

wxString GetErrorMessage ()

Returns the last error message returned by the ODBC manager.

wxDatabase::GetErrorNumber

long GetErrorNumber ()

Returns the last native error. A native error is an ODBC driver dependent error number.

wxDatabase::GetHDBC

HDBC GetHDBC()

Returns the current ODBC database handle.

wxDatabase::GetHENV

HENV GetHENV()

Returns the ODBC environment handle.

wxDatabase::GetInfo

bool GetInfo(**long** *infoType*, **long** **buf*)

bool GetInfo(**long** *infoType*, **const wxString&** *buf*, **int** *bufSize=-1*)

Returns requested information. The return value is TRUE if successful, FALSE otherwise.

infoType is an ODBC identifier specifying the type of information to be returned.

buf is a character or long integer pointer to storage which must be allocated by the application, and which will contain the information if the function is successful.

bufSize is the size of the character buffer. A value of -1 indicates that the size should be computed by the GetInfo function.

wxDatabase::GetPassword

wxString GetPassword()

Returns the password of the current user.

wxDatabase::GetUsername

wxString GetUsername()

Returns the current username.

wxDatabase::GetODBCVersionFloat

float GetODBCVersionFloat(**bool** *implementation=TRUE*)

Returns the version of ODBC in floating point format, e.g. 2.50.

implementation should be TRUE to get the DLL version, or FALSE to get the version defined in the `sql.h` header file.

This function can return the value 0.0 if the header version number is not defined (for early versions of ODBC).

wxDatabase::GetODBCVersionString

wxString GetODBCVersionString(**bool** *implementation=TRUE*)

Returns the version of ODBC in string format, e.g. "02.50".

implementation should be TRUE to get the DLL version, or FALSE to get the version defined in the `sql.h` header file.

This function can return the value "00.00" if the header version number is not defined (for early versions of ODBC).

wxDatabase::InWaitForDataSource

bool InWaitForDataSource()

Not implemented.

wxDatabase::IsOpen

bool IsOpen()

Returns TRUE if a connection is open.

wxDatabase::Open

bool Open(**const wxString&** *datasource*, **bool** *exclusive = FALSE*, **bool** *readOnly = TRUE*, **const wxString&** *username = "ODBC"*, **const wxString&** *password = ""*)

Connect to a data source. *datasource* contains the name of the ODBC data source. The parameters exclusive and readOnly are not used.

wxDatabase::OnSetOptions

void OnSetOptions(**wxRecordSet** **recordSet*)

Not implemented.

wxDatabase::OnWaitForDataSource

void OnWaitForDataSource(**bool** *stillExecuting*)

Not implemented.

wxDatabase::RollbackTrans

bool RollbackTrans()

Sends a rollback to the ODBC driver. Not implemented.

wxDatabase::SetDataSource

void SetDataSource(**const wxString&** *s*)

Sets the name of the data source. Not implemented.

wxDatabase::SetLoginTimeout

void SetLoginTimeout(**long** *seconds*)

Sets the time to wait for an user login. Not implemented.

wxDatabase::SetPassword

void SetPassword(**const wxString&** *s*)

Sets the password of the current user. Not implemented.

wxDatabase::SetSynchronousMode

void SetSynchronousMode(**bool** *synchronous*)

Toggles between synchronous and asynchronous mode. Currently only synchronous mode is supported, so this function has no effect.

wxDatabase::SetQueryTimeout

void SetQueryTimeout(**long** *seconds*)

Sets the time to wait for a response to a query. Not implemented.

wxDatabase::SetUsername

void SetUsername(**const wxString&** *s*)

Sets the name of the current user. Not implemented.

wxDataFormat

A wxDataFormat is an encapsulation of a platform-specific format handle which is used by the system for the clipboard and drag and drop operations. The applications are usually only interested in, for example, pasting data from the clipboard only if the data is in a format the program understands and a data format is something which uniquely identifies this format.

On the system level, a data format is usually just a number (CLIPFORMATunder Windows or Atom under X11, for example) and the standard formats are, indeed, just numbers which can be implicitly converted to wxDataFormat. The standard formats are:

wxDF_INVALID	An invalid format - used as default argument for functions taking a wxDataFormat argument sometimes
wxDF_TEXT	Text format (wxString)
wxDF_BITMAP	A bitmap (wxBitmap)
wxDF_METAFILE	A metafile (wxMetafile, Windows only)
wxDF_FILENAME	A list of filenames

As mentioned above, these standard formats may be passed to any function taking wxDataFormat argument because wxDataFormat has an implicit conversion from them (or, to be precise from the type wxDataFormat::NativeFormat which is the type used by the underlying platform for data formats).

Aside the standard formats, the application may also use custom formats which are identified by their names (strings) and not numeric identifiers. Although internally custom format must be created (or *registered*) first, you shouldn't care about it because it is done automatically the first time the wxDataFormat object corresponding to a given format

name is created. The only implication of this is that you should avoid having global wxDataFormat objects with non-default constructor because their constructors are executed before the program has time to perform all necessary initialisations and so an attempt to do clipboard format registration at this time will usually lead to a crash!

Virtual functions to override

None

Derived from

None

See also

Clipboard and drag and drop overview(p. 1430), *DnD sample* (p. 1330), *wxDataObject* (p. 197)

wxDataFormat::wxDataFormat

wxDataFormat(**NativeFormat** *format* = *wxDF_INVALID*)

Constructs a data format object for one of the standard data formats or an empty data object (use *SetType* (p. 197) or *SetId* (p. 197) later in this case)

wxDataFormat::wxDataFormat

wxDataFormat(**const wxChar** **format*)

Constructs a data format object for a custom format identified by its name *format*.

wxDataFormat::operator ==

bool operator ==(**const wxDataFormat&** *format*) **const**

Returns TRUE if the formats are equal.

wxDataFormat::operator !=

bool operator !=(**const wxDataFormat&** *format*) **const**

Returns TRUE if the formats are different.

wxDataFormat::GetId

wxString GetId() **const**

Returns the name of a custom format (this function will fail for a standard format).

wxDataFormat::GetType

NativeFormat GetType() **const**

Returns the platform-specific number identifying the format.

wxDataFormat::SetId

void SetId(**const wxChar** **format*)

Sets the format to be the custom format identified by the given name.

wxDataFormat::SetType

void SetType(**NativeFormat** *format*)

Sets the format to the given value, which should be one of wxDF_XXX constants.

wxDataObject

A wxDataObject represents data that can be copied to or from the clipboard, or dragged and dropped. The important thing about wxDataObject is that this is a 'smart' piece of data unlike usual 'dumb' data containers such as memory buffers or files. Being 'smart' here means that the data object itself should know what data formats it supports and how to render itself in each of supported formats.

A supported format, incidentally, is exactly the format in which the data can be requested from a data object or from which the data object may be set. In the general case, an object may support different formats on 'input' and 'output', i.e. it may be able to render itself in a given format but not be created from data on this format or vice versa. wxDataObject defines an enumeration type

```
enum Direction
{
    Get  = 0x01,    // format is supported by GetDataHere()
    Set  = 0x02     // format is supported by SetData()
};
```

which allows to distinguish between them. See *wxDataFormat* (p. 195) documentation for more about formats.

Not surprizingly, being 'smart' comes at a price of added complexity. This is reasonable for the situations when you really need to support multiple formats, but may be annoying if you only want to do something simple like cut and paste text.

To provide a solution for both cases, wxWindows has two predefined classes which derive from wxDataObject: *wxDataObjectSimple* (p. 202) and *wxDataObjectComposite* (p. 201). *wxDataObjectSimple* (p. 202) is the simplest wxDataObject possible and only holds data in a single format (such as HTML or text) and *wxDataObjectComposite* (p. 201) is the simplest way to implement wxDataObject which does support multiple formats because it achievs this by simply holding several wxDataObjectSimple objects.

So, you have several solutions when you need a wxDataObject class (and you need one as soon as you want to transfer data via the clipboard or drag and drop):

1. Use one of the built-in classes   You may use wxTextDataObject, wxBitmapDataObject or wxFileDataObject in the simplest cases when you only need to support one format and your data is either text, bitmap or list of files.

2. Use wxDataObjectSimple   Deriving from wxDataObjectSimple is the simplest solution for custom data - you will only support one format and so probably won't be able to communicate with other programs, but data transfer will work in your program (or between different copies of it).

3. Use wxDataObjectComposite   This is a simple but powerful solution which allows you to support any number of formats (either standard or custom if you combine it with the previous solution).

4. Use wxDataObject directly   This is the solution for maximal flexibility and efficiency, but it is also is the most difficult to implement.

Please note that the easiest way to use drag and drop and the clipboard with multiple formats is by using wxDataObjectComposite, but it is not the most efficient one as each wxDataObjectSimple would contain the whole data in its respective formats. Now imagine that you want to paste 200 pages of text in your proprietary format, as well as Word, RTF, HTML, Unicode and plain text to the clipboard and even today's computers are in trouble. For this case, you will have to derive from wxDataObject directly and make it enumerate its formats and provide the data in the requested format on demand.

Note that neither the GTK data transfer mechanisms for the clipboard and drag and drop, nor the OLE data transfer copy any data until another application actually requests the data. This is in contrast to the 'feel' offered to the user of a program who would normally think that the data resides in the clipboard after having pressed 'Copy' - in reality it is only declared to be available.

There are several predefined data object classes derived from wxDataObjectSimple:

wxFileDataObject (p. 409), *wxTextDataObject* (p. 1088) and *wxBitmapDataObject* (p. 75) which can be used without change.

You may also derive your own data object classes from *wxCustomDataObject* (p. 182) for user-defined types. The format of user-defined data is given as mime-type string literal, such as "application/word" or "image/png". These strings are used as they are under Unix (so far only GTK) to identify a format and are translated into their Windows equivalent under Win32 (using the OLE IDataObject for data exchange to and from the clipboard and for drag and drop). Note that the format string translation under Windows is not yet finished.

wxPython note: At this time this class is not directly usable from wxPython. Derive a class from *wxPyDataObjectSimple* (p. 202) instead.

Virtual functions to override

Each class derived directly from wxDataObject must override and implement all of its functions which are pure virtual in the base class.

The data objects which only render their data or only set it (i.e. work in only one direction), should return 0 from *GetFormatCount* (p. 200).

Derived from

None

Include files

<wx/dataobj.h>

See also

Clipboard and drag and drop overview (p. 1430), *DnD sample* (p. 1330), *wxFileDataObject* (p. 409), *wxTextDataObject* (p. 1088), *wxBitmapDataObject* (p. 75), *wxCustomDataObject* (p. 182), *wxDropTarget* (p. 370), *wxDropSource* (p. 368), *wxTextDropTarget* (p. 1096), *wxFileDropTarget* (p. 414)

wxDataObject::wxDataObject

wxDataObject()

Constructor.

wxDataObject::~wxDataObject

~wxDataObject()

Destructor.

wxDataObject::GetAllFormats

virtual void GetAllFormats(**wxDataFormat** *formats, **Direction** *dir = Get*) **const**

Copy all supported formats in the given direction to the array pointed to by *formats*. There is enough space for GetFormatCount(dir) formats in it.

wxDataObject::GetDataHere

virtual bool GetDataHere(**const wxDataFormat&** *format*, **void** **buf*) **const**

The method will write the data of the format *format* in the buffer *buf* and return TRUE on success, FALSE on failure.

wxDataObject::GetDataSize

virtual size_t GetDataSize(**const wxDataFormat&** *format*) **const**

Returns the data size of the given format *format*.

wxDataObject::GetFormatCount

virtual size_t GetFormatCount(**Direction** *dir = Get*) **const**

Returns the number of available formats for rendering or setting the data.

wxDataObject::GetPreferredFormat

virtual wxDataFormat GetPreferredFormat(**Direction** *dir = Get*) **const**

Returns the preferred format for either rendering the data (if *dir* is Get, its default value) or for setting it. Usually this will be the native format of the wxDataObject.

wxDataObject::SetData

virtual bool SetData(**const wxDataFormat&** *format*, **size_t** *len*, **const void** **buf*)

Set the data in the format *format* of the length *len* provided in the buffer *buf*.

Returns TRUE on success, FALSE on failure.

wxDataObjectComposite

wxDataObjectComposite is the simplest *wxDataObject* (p. 197) derivation which may be sued to support multiple formats. It contains several *wxDataObjectSimple* (p. 202) objects and supports any format supported by at least one of them. Only one of these data objects is *preferred* (the first one if not explicitly changed by using the second parameter of *Add* (p. 201)) and its format determines the preferred format of the composite data object as well.

See *wxDataObject* (p. 197) documentation for the reasons why you might prefer to use wxDataObject directly instead of wxDataObjectComposite for efficiency reasons.

Virtual functions to override

None, this class should be used directly.

Derived from

wxDataObject (p. 197)

Include files

<wx/dataobj.h>

See also

Clipboard and drag and drop overview (p. 1430), *wxDataObject* (p. 197), *wxDataObjectSimple* (p. 202), *wxFileDataObject* (p. 409), *wxTextDataObject* (p. 1088), *wxBitmapDataObject* (p. 75)

wxDataObjectComposite::wxDataObjectComposite

wxDataObjectComposite()

The default constructor.

wxDataObjectComposite::Add

void Add(**wxDataObjectSimple** **dataObject*, **bool** *preferred = FALSE*)

Adds the *dataObject* to the list of supported objects and it becomes the preferred object if *preferred* is TRUE.

wxDataObjectSimple

This is the simplest possible implementation of the *wxDataObject* (p. 197) class. The data object of (a class derived from) this class only supports one format, so the number of virtual functions to be implemented is reduced.

Notice that this is still an abstract base class and cannot be used but should be derived from.

wxPython note: If you wish to create a derived wxDataObjectSimple class in wxPython you should derive the class from wxPyDataObjectSimple in order to get Python-aware capabilities for the various virtual methods.

Virtual functions to override

The objects supporting rendering the data must override *GetDataSize* (p. 203) and *GetDataHere* (p. 203) while the objects which may be set must override *SetData* (p. 203). Of course, the objects supporting both operations must override all threee methods.

Derived from

wxDataObject (p. 197)

Include files

<wx/dataobj.h>

See also

Clipboard and drag and drop overview (p. 1430), *DnD sample* (p. 1330), *wxFileDataObject* (p. 409), *wxTextDataObject* (p. 1088), *wxBitmapDataObject* (p. 75)

wxDataObjectSimple::wxDataObjectSimple

wxDataObjectSimple(**const wxDataFormat&** *format = wxFormatInvalid*)

Constructor accepts the supported format (none by default) which may also be set later with *SetFormat* (p. 203).

wxDataObjectSimple::GetFormat

const wxDataFormat& GetFormat() const

Returns the (one and only one) format supported by this object. It is supposed that the format is supported in both directions.

wxDataObjectSimple::SetFormat

void SetFormat(const wxDataFormat& *format*)

Sets the supported format.

wxDataObjectSimple::GetDataSize

virtual size_t GetDataSize() const

Gets the size of our data. Must be implemented in the derived class if the object supports rendering its data.

wxDataObjectSimple::GetDataHere

virtual bool GetDataHere(void **buf*) const

Copy the data to the buffer, return TRUE on success. Must be implemented in the derived class if the object supports rendering its data.

wxPython note: When implementing this method in wxPython, no additional parameters are required and the data should be returned from the method as a string.

wxDataObjectSimple::SetData

virtual bool SetData(size_t *len*, const void **buf*)

Copy the data from the buffer, return TRUE on success. Must be implemented in the derived class if the object supports setting its data.

wxPython note: When implementing this method in wxPython, the data comes as a single string parameter rather than the two shown here.

wxDataInputStream

This class provides functions that read binary data types in a portable way. Data can be read in either big-endian or litte-endian format, little-endian being the default on all

architectures.

If you want to read data from text files (or streams) use *wxTextInputStream* (p. 1090) instead.

The >> operator is overloaded and you can use this class like a standard C++ iostream. Note, however, that the arguments are the fixed size types wxUint32, wxInt32 etc and on a typical 32-bit computer, none of these match to the "long" type (wxInt32 is defined as signed int on 32-bit architectures) so that you cannot use long. To avoid problems (here and elsewhere), make use of the wxInt32, wxUint32, etc types.

For example:

```
wxFileInputStream input( "mytext.dat" );
wxDataInputStream store( input );
wxUint8 i1;
float f2;
wxString line;

store >> i1;        // read a 8 bit integer.
store >> i1 >> f2; // read a 8 bit integer followed by float.
store >> line;     // read a text line
```

See also *wxDataOutputStream* (p. 205).

Derived from

None

Include files

<wx/datstrm.h>

wxDataInputStream::wxDataInputStream

 wxDataInputStream(**wxInputStream&** *stream*)

Constructs a datastream object from an input stream. Only read methods will be available.

Parameters

stream
    The input stream.

wxDataInputStream::~wxDataInputStream

~**wxDataInputStream**()

Destroys the wxDataInputStream object.

wxDataInputStream::BigEndianOrdered

void BigEndianOrdered(**bool** *be_order*)

If *be_order* is TRUE, all data will be read in big-endian order, such as written by programs on a big endian architecture (e.g. Sparc) or written by Java-Streams (which always use big-endian order).

wxDataInputStream::Read8

wxUint8 Read8()

Reads a single byte from the stream.

wxDataInputStream::Read16

wxUint16 Read16()

Reads a 16 bit integer from the stream.

wxDataInputStream::Read32

wxUint32 Read32()

Reads a 32 bit integer from the stream.

wxDataInputStream::ReadDouble

double ReadDouble()

Reads a double (IEEE encoded) from the stream.

wxDataInputStream::ReadString

wxString ReadString()

Reads a string from a stream. Actually, this function first reads a long integer specifying the length of the string (without the last null character) and then reads the string.

wxDataOutputStream

This class provides functions that write binary data types in a portable way. Data can be written in either big-endian or litte-endian format, little-endian being the default on all architectures.

If you want to write data to text files (or streams) use *wxTextOutputStream* (p. 1092) instead.

The << operator is overloaded and you can use this class like a standard C++ iostream. See *wxDataInputStream* (p. 203) for its usage and caveats.

See also *wxDataInputStream* (p. 203).

Derived from

None

wxDataOutputStream::wxDataOutputStream

wxDataOutputStream(**wxOutputStream&** *stream*)

Constructs a datastream object from an output stream. Only write methods will be available.

Parameters

stream
    The output stream.

wxDataOutputStream::~wxDataOutputStream

~wxDataOutputStream()

Destroys the wxDataOutputStream object.

wxDataOutputStream::BigEndianOrdered

void BigEndianOrdered(**bool** *be_order*)

If *be_order* is TRUE, all data will be written in big-endian order, e.g. for reading on a Sparc or from Java-Streams (which always use big-endian order), otherwise data will be written in little-endian order.

wxDataOutputStream::Write8

void Write8(**wxUint8** *i8*)

Writes the single byte *i8* to the stream.

wxDataOutputStream::Write16

void Write16(**wxUint16** *i16*)

Writes the 16 bit integer *i16* to the stream.

wxDataOutputStream::Write32

void Write32(**wxUint32** *i32*)

Writes the 32 bit integer *i32* to the stream.

wxDataOutputStream::WriteDouble

void WriteDouble(**double** *f*)

Writes the double *f* to the stream using the IEEE format.

wxDataOutputStream::WriteString

void WriteString(**const wxString&** *string*)

Writes *string* to the stream. Actually, this method writes the size of the string before writing *string* itself.

wxDate

A class for manipulating dates.

NOTE: this class is retained only for compatibility, and has been replaced by *wxDateTime* (p. 215). wxDate may be withdrawn in future versions of wxWindows.

Derived from

wxObject (p. 750)

Include files

<wx/date.h>

See also

wxTime (p. 1113)

wxDate::wxDate

wxDate()

Default constructor.

wxDate(**const wxDate&** *date*)

Copy constructor.

wxDate(**int** *month*, **int** *day*, **int** *year*)

Constructor taking month, day and year.

wxDate(**long** *julian*)

Constructor taking an integer representing the Julian date. This is the number of days since 1st January 4713 B.C., so to convert from the number of days since 1st January 1901, construct a date for 1/1/1901, and add the number of days.

wxDate(**const wxString&** *dateString*)

Constructor taking a string representing a date. This must be either the string TODAY, or of the form MM/DD/YYYY or MM-DD-YYYY. For example:

```
wxDate date("11/26/1966");
```

Parameters

date
    Date to copy.

month
    Month: a number between 1 and 12.

day
    Day: a number between 1 and 31.

year
    Year, such as 1995, 2005.

wxDate::~wxDate

void ~wxDate()

Destructor.

wxDate::AddMonths

wxDate& AddMonths(**int** *months=1*)

Adds the given number of months to the date, returning a reference to 'this'.

wxDate::AddWeeks

wxDate& AddWeeks(**int** *weeks=1*)

Adds the given number of weeks to the date, returning a reference to 'this'.

wxDate::AddYears

wxDate& AddYears(**int** *years=1*)

Adds the given number of months to the date, returning a reference to 'this'.

wxDate::FormatDate

wxString FormatDate(**int** *type=-1*) **const**

Formats the date according to *type* if not -1, or according to the current display type if -1.

Parameters

type
     -1 or one of:

wxDAY	Format day only.
wxMONTH	Format month only.
wxMDY	Format MONTH, DAY, YEAR.
wxFULL	Format day, month and year in US style: DAYOFWEEK, MONTH, DAY, YEAR.
wxEUROPEAN	Format day, month and year in European style: DAY, MONTH, YEAR.

wxDate::GetDay

int GetDay() **const**

Returns the numeric day (in the range 1 to 31).

wxDate::GetDayOfWeek

int GetDayOfWeek() **const**

Returns the integer day of the week (in the range 1 to 7).

wxDate::GetDayOfWeekName

wxString GetDayOfWeekName() **const**

Returns the name of the day of week.

wxDate::GetDayOfYear

long GetDayOfYear() **const**

Returns the day of the year (from 1 to 365).

wxDate::GetDaysInMonth

int GetDaysInMonth() **const**

Returns the number of days in the month (in the range 1 to 31).

wxDate::GetFirstDayOfMonth

int GetFirstDayOfMonth() **const**

Returns the day of week that is first in the month (in the range 1 to 7).

wxDate::GetJulianDate

long GetJulianDate() **const**

Returns the Julian date.

wxDate::GetMonth

int GetMonth() **const**

Returns the month number (in the range 1 to 12).

wxDate::GetMonthEnd

wxDate GetMonthEnd()

Returns the date representing the last day of the month.

wxDate::GetMonthName

wxString GetMonthName() **const**

Returns the name of the month. Do not delete the returned storage.

wxDate::GetMonthStart

wxDate GetMonthStart() **const**

Returns the date representing the first day of the month.

wxDate::GetWeekOfMonth

int GetWeekOfMonth() **const**

Returns the week of month (in the range 1 to 6).

wxDate::GetWeekOfYear

int GetWeekOfYear() **const**

Returns the week of year (in the range 1 to 52).

wxDate::GetYear

int GetYear() **const**

Returns the year as an integer (such as '1995').

wxDate::GetYearEnd

wxDate GetYearEnd() const

Returns the date representing the last day of the year.

wxDate::GetYearStart

wxDate GetYearStart() const

Returns the date representing the first day of the year.

wxDate::IsLeapYear

bool IsLeapYear() const

Returns TRUE if the year of this date is a leap year.

wxDate::Set

wxDate& Set()

Sets the date to current system date, returning a reference to 'this'.

wxDate& Set(long *julian*)

Sets the date to the given Julian date, returning a reference to 'this'.

wxDate& Set(int *month*, int *day*, int *year*)

Sets the date to the given date, returning a reference to 'this'.

month is a number from 1 to 12.

day is a number from 1 to 31.

year is a year, such as 1995, 2005.

wxDate::SetFormat

void SetFormat(int *format*)

Sets the current format type.

Parameters

format

-1 or one of:

wxDAY	Format day only.
wxMONTH	Format month only.
wxMDY	Format MONTH, DAY, YEAR.
wxFULL	Format day, month and year in US style: DAYOFWEEK, MONTH, DAY, YEAR.
wxEUROPEAN	Format day, month and year in European style: DAY, MONTH, YEAR.

wxDate::SetOption

int SetOption(**int** *option*, **const bool** *enable=TRUE*)

Enables or disables an option for formatting.

Parameters

option
    May be one of:

wxNO_CENTURY	The century is not formatted.
wxDATE_ABBR	Month and day names are abbreviated to 3 characters when formatting.

wxDate::operator wxString

 operator wxString()

Conversion operator, to convert wxDate to wxString by calling FormatDate.

wxDate::operator +

wxDate operator +(**long** *i*)

wxDate operator +(**int** *i*)

Adds an integer number of days to the date, returning a date.

wxDate::operator -

wxDate operator -(**long** *i*)

wxDate operator -(**int** *i*)

Subtracts an integer number of days from the date, returning a date.

long operator -(**const wxDate&** *date*)

Subtracts one date from another, return the number of intervening days.

wxDate::operator +=

wxDate& operator +=(**long** *i*)

Postfix operator: adds an integer number of days to the date, returning a reference to 'this' date.

wxDate::operator -=

wxDate& operator -=(**long** *i*)

Postfix operator: subtracts an integer number of days from the date, returning a reference to 'this' date.

wxDate::operator ++

wxDate& operator ++()

Increments the date (postfix or prefix).

wxDate::operator --

wxDate& operator –()

Decrements the date (postfix or prefix).

wxDate::operator <

friend bool operator <(**const wxDate&** *date1*, **const wxDate&** *date2*)

Function to compare two dates, returning TRUE if *date1* is earlier than *date2*.

wxDate::operator <=

friend bool operator <=(**const wxDate&** *date1*, **const wxDate&** *date2*)

Function to compare two dates, returning TRUE if *date1* is earlier than or equal to *date2*.

wxDate::operator >

friend bool operator >(**const wxDate&** *date1*, **const wxDate&** *date2*)

Function to compare two dates, returning TRUE if *date1* is later than *date2*.

wxDate::operator >=

friend bool operator >=(**const wxDate&** *date1*, **const wxDate&** *date2*)

Function to compare two dates, returning TRUE if *date1* is later than or equal to *date2*.

wxDate::operator ==

friend bool operator ==(**const wxDate&** *date1*, **const wxDate&** *date2*)

Function to compare two dates, returning TRUE if *date1* is equal to *date2*.

wxDate::operator !=

friend bool operator !=(**const wxDate&** *date1*, **const wxDate&** *date2*)

Function to compare two dates, returning TRUE if *date1* is not equal to *date2*.

wxDate::operator <<

friend ostream& operator <<(**ostream&** *os*, **const wxDate&** *date*)

Function to output a wxDate to an ostream.

wxDateSpan

The documentation for this section has not yet been written.

wxDateTime

wxDateTime class represents an absolute moment in the time.

Types

The type `wxDateTime_t` is typedefed as `unsigned short` and is used to contain the number of years, hours, minutes, seconds and milliseconds.

Constants

Global constant `wxDefaultDateTime` and synonym for it `wxInvalidDateTime` are defined. This constant will be different from any valid wxDateTime object.

All the following constants are defined inside wxDateTime class (i.e., to refer to them you should prepend their names with `wxDateTime::`).

Time zone symbolic names:

```
    enum TZ
    {
        // the time in the current time zone
        Local,

        // zones from GMT (= Greenwhich Mean Time): they're guaranteed
to be
        // consequent numbers, so writing something like `GMT0 +
offset' is
        // safe if abs(offset) <= 12

        // underscore stands for minus
        GMT_12, GMT_11, GMT_10, GMT_9, GMT_8, GMT_7,
        GMT_6, GMT_5, GMT_4, GMT_3, GMT_2, GMT_1,
        GMT0,
        GMT1, GMT2, GMT3, GMT4, GMT5, GMT6,
        GMT7, GMT8, GMT9, GMT10, GMT11, GMT12,
        // Note that GMT12 and GMT_12 are not the same: there is a
difference
        // of exactly one day between them

        // some symbolic names for TZ

        // Europe
        WET = GMT0,                         // Western Europe Time
        WEST = GMT1,                        // Western Europe Summer
Time
        CET = GMT1,                         // Central Europe Time
        CEST = GMT2,                        // Central Europe Summer
Time
        EET = GMT2,                         // Eastern Europe Time
        EEST = GMT3,                        // Eastern Europe Summer
Time
        MSK = GMT3,                         // Moscow Time
        MSD = GMT4,                         // Moscow Summer Time

        // US and Canada
```

```
        AST = GMT_4,                            // Atlantic Standard Time
        ADT = GMT_3,                            // Atlantic Daylight Time
        EST = GMT_5,                            // Eastern Standard Time
        EDT = GMT_4,                            // Eastern Daylight Saving
Time
        CST = GMT_6,                            // Central Standard Time
        CDT = GMT_5,                            // Central Daylight Saving
Time
        MST = GMT_7,                            // Mountain Standard Time
        MDT = GMT_6,                            // Mountain Daylight Saving
Time
        PST = GMT_8,                            // Pacific Standard Time
        PDT = GMT_7,                            // Pacific Daylight Saving
Time
        HST = GMT_10,                           // Hawaiian Standard Time
        AKST = GMT_9,                           // Alaska Standard Time
        AKDT = GMT_8,                           // Alaska Daylight Saving
Time

        // Australia

        A_WST = GMT8,                           // Western Standard Time
        A_CST = GMT12 + 1,                      // Central Standard Time
(+9.5)
        A_EST = GMT10,                          // Eastern Standard Time
        A_ESST = GMT11,                         // Eastern Summer Time

        // Universal Coordinated Time = the new and politically correct
name
        // for GMT
        UTC = GMT0
    };
```

Month names: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec and
Inv_Month for an invalid.month value are the values of `wxDateTime::Month`enum.

Likewise, Sun, Mon, Tue, Wed, Thu, Fri, Sat, and Inv_WeekDay are the values
in`wxDateTime::WeekDay` enum.

Finally, Inv_Year is defined to be an invalid value for year parameter.

GetMonthName() (p. 225) and*GetWeekDayName* (p. 225) functions use the followign
flags:

```
    enum NameFlags
    {
        Name_Full = 0x01,      // return full name
        Name_Abbr = 0x02       // return abbreviated name
    };
```

Several functions accept an extra parameter specifying the calendar to use (although
most of them only support now the Gregorian calendar). This parameters is one of the
following values:

```
    enum Calendar
```

```
    {
        Gregorian,  // calendar currently in use in Western countries
        Julian      // calendar in use since -45 until the 1582 (or
later)
    };
```

Date calculatiosn often depend on the country adn wxDateTime allows to set the country which conventions should be used using*SetCountry* (p. 226). It takes one of the following values as parameter:

```
    enum Country
    {
        Country_Unknown, // no special information for this country
        Country_Default, // set the default country with SetCountry()
method
                         // or use the default country with any other

        Country_WesternEurope_Start,
        Country_EEC = Country_WesternEurope_Start,
        France,
        Germany,
        UK,
        Country_WesternEurope_End = UK,

        Russia,

        USA
    };
```

Differnet parst of the world use different conventions for the week start. In some countries, the week starts on Sunday, while in others - on Monday. The ISO standard doesn't address this issue, so we support both conventions in the functions whose result depends on it (*GetWeekOfYear* (p. 233) and*GetWeekOfMonth* (p. 233)).

The desired behvaiour may be specified by giving one of the following constants as argument to these functions:

```
    enum WeekFlags
    {
        Default_First,   // Sunday_First for US, Monday_First for the
rest
        Monday_First,    // week starts with a Monday
        Sunday_First     // week starts with a Sunday
    };
```

Derived from

No base class

Include files

<wx/datetime.h>

See also

Date classes overview (p. 1343), wxTimeSpan, wxDateSpan, *wxCalendarCtrl* (p. 95)

Static functions

For convenience, all static functions are collected here. These functions either set or return the static variables of wxDateSpan (the country), return the current moment, year, month or number of days in it, or do some general calendar-related actions.

Please note that although several function accept an extra *Calendar* parameter, it is currently ignored as only the Gregorian calendar is supported. Future versions will support other calendars.

wxPython note: These methods are standalone functions named wxDateTime_<StaticMethodName> in wxPython.

SetCountry (p. 226)
GetCountry (p. 224)
IsWestEuropeanCountry (p. 226)
GetCurrentYear (p. 224)
ConvertYearToBC (p. 223)
GetCurrentMonth (p. 224)
IsLeapYear (p. 225)
GetCentury (p. 224)
GetNumberOfDays (p. 225)
GetNumberOfDays (p. 225)
GetMonthName (p. 225)
GetWeekDayName (p. 225)
GetAmPmStrings (p. 223)
IsDSTApplicable (p. 226)
GetBeginDST (p. 223)
GetEndDST (p. 224)
Now (p. 226)
UNow (p. 227)
Today (p. 227)

Constructors, assignment operators and setters

Constructors and various Set() methods are collected here. If you construct a date object from separate values for day, month and year, you should use *IsValid* (p. 231) method to check that the values were correct as constructors can not return an error code.

wxDateTime() (p. 227)
wxDateTime(time_t) (p. 227)
wxDateTime(struct tm) (p. 227)

Accessors

Here are the trivial accessors. Other functions, which might have to perform some more complicated calculations to find the answer are under *Calendar calculations* (p. 222) section.

Date comparison

There are several function to allow date comparison. To supplement them, a few global operators >, < etc taking wxDateTime are defined.

Date arithmetics

These functions carry out *arithmetics* (p. 1345) on the wxDateTime objects. As explained in the overview, either wxTimeSpan or wxDateSpan may be added to wxDateTime, hence all functions are overloaded to accept both arguments.

Also, both `Add()` and `Subtract()` have both const and non-const version. The first one returns a new obejct which represents the sum/difference of the original one with the argument while the second form modifies the object to which it is applied. The operators -= and += are defined to be equivalent to the second forms of these functions.

Parsing and formatting dates

These functions perform convert wxDateTime obejcts to and from text. The conversions to text are mostly trivial: you can either do it using the default date and time representations for the current locale (*FormatDate* (p. 238) and *FormatTime* (p. 238)), using the international standard representation defined by ISO 8601 (*FormatISODate* (p. 238) and *FormatISOTime* (p. 238)) or by specifying any format at all and using *Format* (p. 238) directly.

The conversions from text are more interesting, as there are much more possibilities to care about. The simples cases can be taken care of with *ParseFormat* (p. 236) which can parse any date in the given (rigid) format. *ParseRfc822Date* (p. 236) is another function for parsing dates in predefined format - the one of RFC 822 which (still...) defines the format of email messages on the Internet. This format can not be described with `strptime(3)`-like format strings used by *Format* (p. 238), hence the need for a separate function.

But the most interesting functions are *ParseDateTime* (p. 237) and *ParseDate* (p. 237) and *ParseTime* (p. 237). They try to parse the date ans time (or only one of them) in 'free' format, i.e. allow them to be specified in any of possible ways. These functions will

usually be used to parse the (interactive) user input which is not bound to be in any predefined format. As an example, *ParseDateTime* (p. 237) can parse the strings such as "tomorrow", "March first", "next Sunday".

Calendar calculations

The functions in this section perform the basic calendar calculations, mostly related to the week days. They allow to find the given week day in the week with given number (either in the month or in the year) and so on.

All (non-const) functions in this section don't modify the time part of the wxDateTime - they only work with the date part of it.

Astronomical/historical functions

Some degree of support for the date units used in astronomy and/or history is provided. You can construct a wxDateTime object from a *JDN* (p. 229) and you may also get its JDN, *MJD* (p. 242) or *Rata Die number* (p. 242) from it.

wxDateTime(double jdn) (p. 228)

Time zone and DST support

Please see the *time zone overview* (p. 1346) for more information about time zones. ormally, these functions should be rarely used.

wxDateTime::ConvertYearToBC

static int ConvertYearToBC(**int** *year*)

Converts the year in absolute notation (i.e. a number which can be negative, positive or zero) to the year in BC/AD notation. For the positive years, nothing is done, but the year 0 is year 1 BC and so for other years there is a difference of 1.

This function should be used like this:

```
    wxDateTime dt(...);
    int y = dt.GetYear();
    printf("The year is %d%s", wxDateTime::ConvertYearToBC(y), y > 0 ?
"AD" : "BC");
```

wxDateTime::GetAmPmStrings

static void GetAmPmStrings(**wxString** **am*, **wxString** **pm*)

Returns the translations of the strings AM and PM used for time formatting for the current locale. Either of the pointers may be NULL if the corresponding value is not needed.

wxDateTime::GetBeginDST

static wxDateTime GetBeginDST(**int** *year = Inv_Year*, **Country** *country =*
Country_Default)

Get the beginning of DST for the given country in the given year (current one by default).
This function suffers from limitations described in *DST overview* (p. 1347).

See also

GetEndDST (p. 224)

wxDateTime::GetCountry

static Country GetCountry()

Returns the current default country. The default country is used for DST calculations, for
example.

See also

SetCountry (p. 226)

wxDateTime::GetCurrentYear

static int GetCurrentYear(**Calendar** *cal = Gregorian*)

Get the current year in given calendar (only Gregorian is currently supported).

wxDateTime::GetCurrentMonth

static Month GetCurrentMonth(**Calendar** *cal = Gregorian*)

Get the current month in given calendar (only Gregorian is currently supported).

wxDateTime::GetCentury

static int GetCentury(**int** *year = Inv_Year*)

Get the current century, i.e. first two digits of the year, in given calendar (only Gregorian
is currently supported).

wxDateTime::GetEndDST

static wxDateTime GetEndDST(**int** *year = Inv_Year*, **Country** *country =*
Country_Default)

Returns the end of DST for the given country in the given year (current one by default).

See also

GetBeginDST (p. 223)

wxDateTime::GetMonthName

static wxString GetMonthName(**Month** *month*, **NameFlags** *flags = Name_Full*)

Gets the full (default) or abbreviated (specify `Name_Abbr` name of the given month.

See also

GetWeekDayName (p. 225)

wxDateTime::GetNumberOfDays

static wxDateTime_t GetNumberOfDays(**int** *year*, **Calendar** *cal = Gregorian*)

static wxDateTime_t GetNumberOfDays(**Month** *month*, **int** *year = Inv_Year*, **Calendar** *cal = Gregorian*)

Returns the number of days in the given year or in the given month of the year.

The only supported value for *cal* parameter is currently `Gregorian`.

wxPython note: These two methods are named `GetNumberOfDaysInYear`and `GetNumberOfDaysInMonth` in wxPython.

wxDateTime::GetWeekDayName

static wxString GetWeekDayName(**WeekDay** *weekday*, **NameFlags** *flags = Name_Full*)

Gets the full (default) or abbreviated (specify `Name_Abbr` name of the given week day.

See also

GetMonthName (p. 225)

wxDateTime::IsLeapYear

static bool IsLeapYear(**int** *year = Inv_Year*, **Calendar** *cal = Gregorian*)

Returns TRUE if the *year* is a leap one in the specified calendar.

This functions supports Gregorian and Julian calendars.

wxDateTime::IsWestEuropeanCountry

static bool IsWestEuropeanCountry(**Country** *country = Country_Default*)

This function returns TRUE if the specified (or default) country is one of Western European ones. It is used internally by wxDateTime to determine the DST convention and date and time formatting rules.

wxDateTime::IsDSTApplicable

static bool IsDSTApplicable(**int** *year = Inv_Year*, **Country** *country = Country_Default*)

Returns TRUE if DST was usedi n the given year (the current one by default) in the given country.

wxDateTime::Now

static wxDateTime Now()

Returns the object corresopnding to the current time.

Example:

```
    wxDateTime now = wxDateTime::Now();
    printf("Current time in Paris:\t%s\n", now.Format("%c",
wxDateTime::CET).c_str());
```

Note that this function is accurate up to second: *wxDateTime::UNow* (p. 227) should be used for better precision (but it is less efficient and might not be availabel on all platforms).

See also

Today (p. 227)

wxDateTime::SetCountry

static void SetCountry(**Country** *country*)

Sets the country to use by default. This setting influences the DST calculations, date formatting and other things.

The possible values for *country* parameter are enumerated in *wxDateTime constants section* (p. 215).

See also

GetCountry (p. 224)

wxDateTime::Today

static wxDateTime Today()

Returns the object corresponding to the midnight of the current day (i.e. the same as *Now()* (p. 226), but the time part is set to 0).

See also

Now (p. 226)

wxDateTime::UNow

static wxDateTime UNow()

Returns the object corresopnding to the current time including the milliseconds if a function to get time with such precision is available on the current platform (supported under most Unices and Win32).

See also

Now (p. 226)

wxDateTime::wxDateTime

wxDateTime()

Default constructor. Use one of `Set()` functions to initialize the object later.

wxDateTime::wxDateTime

wxDateTime& wxDateTime(time_t *timet*)

Same as *Set* (p. 227).

wxPython note: This constructor is named `wxDateTimeFromTimeT` in wxPython.

wxDateTime::wxDateTime

wxDateTime& wxDateTime(**const struct tm&** *tm*)

Same as *Set* (p. 227)

wxPython note: Unsupported.

wxDateTime::wxDateTime

wxDateTime& wxDateTime(**double** *jdn*)

Same as *Set* (p. 228)

wxPython note: This constructor is named `wxDateTimeFromJDN` in wxPython.

wxDateTime::wxDateTime

wxDateTime& wxDateTime(**wxDateTime_t** *hour*, **wxDateTime_t** *minute = 0*,
wxDateTime_t *second = 0*, **wxDateTime_t** *millisec = 0*)

Same as *Set* (p. 228)

wxPython note: This constructor is named `wxDateTimeFromHMS` in wxPython.

wxDateTime::wxDateTime

wxDateTime& wxDateTime(**wxDateTime_t** *day*, **Month**   *month = Inv_Month*,
wxDateTime_t *hour = 0*, **wxDateTime_t** *minute = 0*, **wxDateTime_t** *second = 0*,
wxDateTime_t *millisec = 0*)

Same as *Set* (p. 229)

wxPython note: This constructor is named `wxDateTimeFromDMY` in wxPython.

wxDateTime::SetToCurrent

wxDateTime& SetToCurrent()

Sets the date and time of to the current values. Same as assigning the result of *Now()*
(p. 226) to this object.

wxDateTime::Set

wxDateTime& Set(**time_t** *timet*)

Constructs the object from *timet* value holding the number of seconds since Jan 1, 1970.

wxPython note: This method is named `SetTimeT` in wxPython.

wxDateTime::Set

wxDateTime& Set(**const struct tm&** *tm*)

Sets the date and tiem from the broken down representation in the standard`tm` structure.

wxPython note: Unsupported.

wxDateTime::Set

wxDateTime& Set(**double** *jdn*)

Sets the date from the so-called *Julian Day Number*.

By definition, the Julian Day Number, usually abbreviated as JDN, of a particular instant is the fractional number of days since 12 hours Universal Coordinated Time (Greenwhich mean noon) on January 1 of the year -4712 in the Julian proleptic calendar.

wxPython note: This method is named `SetJDN` in wxPython.

wxDateTime::Set

wxDateTime& Set(**wxDateTime_t** *hour*, **wxDateTime_t** *minute = 0*, **wxDateTime_t** *second = 0*, **wxDateTime_t** *millisec = 0*)

Sets the date to be equal to *Today* (p. 227) and the time from supplied parameters.

wxPython note: This method is named `SetHMS` in wxPython.

wxDateTime::Set

wxDateTime& Set(**wxDateTime_t** *day*, **Month** *month = Inv_Month*, **wxDateTime_t** *hour = 0*, **wxDateTime_t** *minute = 0*, **wxDateTime_t** *second = 0*, **wxDateTime_t** *millisec = 0*)

Sets the date and time from the parameters.

wxDateTime::ResetTime

wxDateTime& ResetTime()

Reset time to midnight (00:00:00) without changing the date.

wxDateTime::SetYear

wxDateTime& SetYear(**int** *year*)

Sets the year without changing other date components.

wxDateTime::SetMonth

wxDateTime& SetMonth(**Month** *month*)

Sets the month without changing other date components.

wxDateTime::SetDay

wxDateTime& SetDay(**wxDateTime_t** *day*)

Sets the day without changing other date components.

wxDateTime::SetHour

wxDateTime& SetHour(**wxDateTime_t** *hour*)

Sets the hour without changing other date components.

wxDateTime::SetMinute

wxDateTime& SetMinute(**wxDateTime_t** *minute*)

Sets the minute without changing other date components.

wxDateTime::SetSecond

wxDateTime& SetSecond(**wxDateTime_t** *second*)

Sets the second without changing other date components.

wxDateTime::SetMillisecond

wxDateTime& SetMillisecond(**wxDateTime_t** *millisecond*)

Sets the millisecond without changing other date components.

wxDateTime::operator=

wxDateTime& operator(**time_t** *timet*)

Same as *Set* (p. 228).

wxDateTime::operator=

wxDateTime& operator(**const struct tm&** *tm*)

Same as *Set* (p. 229).

wxDateTime::IsValid

bool IsValid() **const**

Returns TRUE if the object represents a valid time moment.

wxDateTime::GetTm

Tm GetTm(**const TimeZone&** *tz = Local*) **const**

Returns broken down representation of the date and time.

wxDateTime::GetTicks

time_t GetTicks() **const**

Returns the number of seconds since Jan 1, 1970. An assert failure will occur if the date is not in the range covered by time_t type.

wxDateTime::GetYear

int GetYear(**const TimeZone&** *tz = Local*) **const**

Returns the year in the given timezone (local one by default).

wxDateTime::GetMonth

Month GetMonth(**const TimeZone&** *tz = Local*) **const**

Returns the month in the given timezone (local one by default).

wxDateTime::GetDay

wxDateTime_t GetDay(**const TimeZone&** *tz = Local*) **const**

Returns the day in the given timezone (local one by default).

wxDateTime::GetWeekDay

WeekDay GetWeekDay(**const TimeZone&** *tz = Local*) **const**

Returns the week day in the given timezone (local one by default).

wxDateTime::GetHour

wxDateTime_t GetHour(**const TimeZone&** *tz = Local*) **const**

Returns the hour in the given timezone (local one by default).

wxDateTime::GetMinute

wxDateTime_t GetMinute(**const TimeZone&** *tz = Local*) **const**

Returns the minute in the given timezone (local one by default).

wxDateTime::GetSecond

wxDateTime_t GetSecond(**const TimeZone&** *tz = Local*) **const**

Returns the seconds in the given timezone (local one by default).

wxDateTime::GetMillisecond

wxDateTime_t GetMillisecond(**const TimeZone&** *tz = Local*) **const**

Returns the milliseconds in the given timezone (local one by default).

wxDateTime::GetDayOfYear

wxDateTime_t GetDayOfYear(**const TimeZone&** *tz = Local*) **const**

Returns the day of the year (in 1...366 range) in the given timezone (local one by default).

wxDateTime::GetWeekOfYear

wxDateTime_t GetWeekOfYear(**WeekFlags** *flags = Monday_First,* **const TimeZone&** *tz = Local*) **const**

Returns the number of the week of the year this date is in. The first week of the year is, according to international standards, the one containing Jan 4. The week number is in 1...53 range (52 for non leap years).

The function depends on the *week start* (p. 215) convention specified by the *flags* argument.

wxDateTime::GetWeekOfMonth

wxDateTime_t GetWeekOfMonth(**WeekFlags** *flags = Monday_First,* **const TimeZone&** *tz = Local*) **const**

Returns the ordinal number of the week in the month (in 1...5 range).

As *GetWeekOfYear* (p. 233), this function supports both conventions for the week start. See the description of these *week start* (p. 215) conventions.

wxDateTime::IsWorkDay

bool IsWorkDay(**Country** *country = Country_Default*) **const**

Returns TRUE is this day is not a holiday in the given country.

wxDateTime::IsGregorianDate

bool IsGregorianDate(**GregorianAdoption** *country = Gr_Standard*) **const**

Returns TRUE if the given date os later than the date of adoption of the Gregorian calendar in the given country (and hence the Gregorian calendar calculations make sense for it).

wxDateTime::IsEqualTo

bool IsEqualTo(**const wxDateTime&** *datetime*) **const**

Returns TRUE if the two dates are strictly identical.

wxDateTime::IsEarlierThan

bool IsEarlierThan(**const wxDateTime&***datetime*) **const**

Returns TRUE if this date precedes the given one.

wxDateTime::IsLaterThan

bool IsLaterThan(**const wxDateTime&***datetime*) **const**

Returns TRUE if this date is later than the given one.

wxDateTime::IsStrictlyBetween

bool IsStrictlyBetween(**const wxDateTime&***t1*, **const wxDateTime&***t2*) **const**

Returns TRUE if this date lies strictly between the two others,

See also

IsBetween (p. 234)

wxDateTime::IsBetween

bool IsBetween(**const wxDateTime&***t1*, **const wxDateTime&***t2*) **const**

Returns TRUE if *IsStrictlyBetween* (p. 234)is TRUE or if the date is equal to one of the limi
values.

See also

IsStrictlyBetween (p. 234)

wxDateTime::IsSameDate

bool IsSameDate(**const wxDateTime&***dt*) **const**

Returns TRUE if the date is the same without comparing the time parts.

wxDateTime::IsSameTime

bool IsSameTime(**const wxDateTime&***dt*) **const**

Returns TRUE if the time is the same (although dates may differ).

wxDateTime::IsEqualUpTo

bool IsEqualUpTo(**const wxDateTime&** *dt*, **const wxTimeSpan&** *ts*) **const**

Returns TRUE if the date is equal to another one up to the given time interval, i.e. if the absolute difference between the two dates is less than this interval.

wxDateTime::Add

wxDateTime Add(**const wxTimeSpan&** *diff*) **const**

wxDateTime& Add(**const wxTimeSpan&** *diff*)

wxDateTime& operator+=(**const wxTimeSpan&** *diff*)

Adds the given time span to this object.

wxPython note: This method is named AddTS in wxPython.

wxDateTime::Subtract

wxDateTime Subtract(**const wxTimeSpan&** *diff*) **const**

wxDateTime& Subtract(**const wxTimeSpan&** *diff*)

wxDateTime& operator-=(**const wxTimeSpan&** *diff*)

Subtracts the given time span from this object.

wxPython note: This method is named SubtractTS in wxPython.

wxDateTime::Add

wxDateTime Add(**const wxDateSpan&** *diff*) **const**

wxDateTime& Add(**const wxDateSpan&** *diff*)

wxDateTime& operator+=(**const wxDateSpan&** *diff*)

Adds the given date span to this object.

wxPython note: This method is named `AddDS` in wxPython.

wxDateTime::Subtract

wxDateTime Subtract(**const wxDateSpan&** *diff*) **const**

wxDateTime& Subtract(**const wxDateSpan&** *diff*)

wxDateTime& operator-=(**const wxDateSpan&** *diff*)

Subtracts the given date span from this object.

wxPython note: This method is named `SubtractDS` in wxPython.

wxDateTime::Subtract

wxTimeSpan Subtract(**const wxDateTime&** *dt*) **const**

Subtracts another date from this one and returns the difference between them as wxTimeSpan.

wxDateTime::ParseRfc822Date

const wxChar * ParseRfc822Date(**const wxChar*** *date*)

Parses the string *date* looking for a date formatted according to the RFC 822 in it. The exact description of this format may, of course, be found in the RFC (section 5), but, briefly, this is the format used in the headers of Internet email messages and one of the most common strings expressing date in this format may be something like `"Sat, 18 Dec 1999 00:48:30 +0100"`.

Returns `NULL` if the conversion failed, otherwise return the pointer to the character immediately following the part of the string which could be parsed. If the entire string contains only the date in RFC 822 format, the returned pointer will be pointing to a `NUL` character.

This function is intenionally strict, it will return an error for any string which is not RFC 822 compliant. If you need to parse date formatted in more free ways, you should use *ParseDateTime* (p. 237) or *ParseDate* (p. 237) instead.

wxDateTime::ParseFormat

const wxChar * ParseFormat(**const wxChar ****date*, **const wxChar ****format = "%c"*, **const wxDateTime&** *dateDef = wxDefaultDateTime*)

This function parses the string *date* according to the given *format*. The system `strptime(3)` function is used whenever available, but even if it is not, this function is still implemented (although support for locale-dependent format specificators such as `"%c"`, `"%x"` or `"%X"` may be not perfect). This function does handle the month and weekday names in the current locale on all platforms, however.

Please the description of ANSI C function `strftime(3)` for the syntax of the format string.

The *dateDef* parameter is used to fill in the fields which could not be determined from the format string. For example, if the format is `"%d"` (the day of the month), the month and the year are taken from *dateDef*. If it is not specified, *Today* (p. 227) is used as the default date.

Returns NULL if the conversion failed, otherwise return the pointer to the character which stopped the scan.

wxDateTime::ParseDateTime

const wxChar * ParseDateTime (const wxChar *datetime)

Parses the string *datetime* containing the date and time in free format. This function tries as hard as it can to interpret the given string as date and time. Unlike *ParseRfc822Date* (p. 236), it will accept anything that may be accepted and will only reject strings which can not be parsed in any way at all.

Returns NULL if the conversion failed, otherwise return the pointer to the character which stopped the scan.

wxDateTime::ParseDate

const wxChar * ParseDate (const wxChar *date)

This function is like *ParseDateTime* (p. 237), but it only allows the date to be specified. It is thus flexible then *ParseDateTime* (p. 237), but also has less chances to misinterpret the user input.

Returns NULL if the conversion failed, otherwise return the pointer to the character which stopped the scan.

wxDateTime::ParseTime

const wxChar * ParseTime (const wxChar *time)

This functions is like *ParseDateTime* (p. 237), but only allows the time to be specified in the input string.

Returns NULL if the conversion failed, otherwise return the pointer to the character which stopped the scan.

wxDateTime::Format

wxString Format(**const wxChar** **format* = *"%c"*, **const TimeZone&** *tz* = *Local*) **const**

This function does the same as the standard ANSI C strftime(3) function. Please see its description for the meaning of *format* parameter.

It also accepts a few wxWindows-specific extensions: you can optionally specify the width of the field to follow using printf(3)-like syntax and the format specificator %l can be used to get the number of milliseconds.

See also

ParseFormat (p. 236)

wxDateTime::FormatDate

wxString FormatDate() **const**

Identical to calling *Format()* (p. 238) with "%x" argument (which means 'preferred date representation for the current locale').

wxDateTime::FormatTime

wxString FormatTime() **const**

Identical to calling *Format()* (p. 238) with "%X" argument (which means 'preferred time representation for the current locale').

wxDateTime::FormatISODate

wxString FormatISODate() **const**

This function returns the date representation in the ISO 8601 format (YYYY-MM-DD).

wxDateTime::FormatISOTime

wxString FormatISOTime() **const**

This function returns the time representation in the ISO 8601 format (HH:MM:SS).

wxDateTime::SetToWeekDayInSameWeek

wxDateTime& SetToWeekDayInSameWeek(**WeekDay** *weekday*)

Adjusts the date so that it will still lie in the same week as before, but its week day will be the given one.

Returns the reference to the modified object itself.

wxDateTime::GetWeekDayInSameWeek

wxDateTime GetWeekDayInSameWeek(**WeekDay** *weekday*) **const**

Returns the copy of this object to which*SetToWeekDayInSameWeek* (p. 239) was applied.

wxDateTime::SetToNextWeekDay

wxDateTime& SetToNextWeekDay(**WeekDay** *weekday*)

Sets the date so that it will be the first *weekday* following the current date.

Returns the reference to the modified object itself.

wxDateTime::GetNextWeekDay

wxDateTime GetNextWeekDay(**WeekDay** *weekday*) **const**

Returns the copy of this object to which*SetToNextWeekDay* (p. 239) was applied.

wxDateTime::SetToPrevWeekDay

wxDateTime& SetToPrevWeekDay(**WeekDay** *weekday*)

Sets the date so that it will be the last *weekday* before the current date.

Returns the reference to the modified object itself.

wxDateTime::GetPrevWeekDay

wxDateTime GetPrevWeekDay(**WeekDay** *weekday*) **const**

Returns the copy of this object to which*SetToPrevWeekDay* (p. 239) was applied.

wxDateTime::SetToWeekDay

bool SetToWeekDay(**WeekDay** *weekday*, **int** *n = 1*, **Month** *month = Inv_Month*, **int** *year = Inv_Year*)

Sets the date to the *n*-th *weekday* in the given month of the given year (the current month and year are used by default). The parameter *n*may be either opsitive (counting from the beginning of the month) or negative (counting from the end of it).

For example, `SetToWeekDay(2, wxDateTime::Wed)` will set the date to the second Wednesday in the current month and`SetToWeekDay(-1, wxDateTime::Sun)` - to the last Sunday in it.

Returns `TRUE` if the date was modified successfully, `FALSE`otherwise meaning that the specified date doesn't exist.

wxDateTime::GetWeekDay

wxDateTime GetWeekDay(**WeekDay** *weekday*, **int** *n = 1*, **Month** *month = Inv_Month*, **int** *year = Inv_Year*) **const**

Returns the copy of this object to which*SetToWeekDay* (p. 240) was applied.

wxDateTime::SetToLastWeekDay

bool SetToLastWeekDay(**WeekDay** *weekday*, **Month** *month = Inv_Month*, **int** *year = Inv_Year*)

The effect of calling this function is the same as of calling`SetToWeekDay(-1, weekday, month, year)`. The date will be set to the last*weekday* in the given month and year (the current ones by default).

Always returns `TRUE`.

wxDateTime::GetLastWeekDay

wxDateTime GetLastWeekDay(**WeekDay** *weekday*, **Month** *month = Inv_Month*, **int** *year = Inv_Year*)

Returns the copy of this object to which*SetToLastWeekDay* (p. 240) was applied.

wxDateTime::SetToTheWeek

bool SetToTheWeek(**wxDateTime_t** *numWeek*, **WeekDay** *weekday* = *Mon*)

Set the date to the given *weekday* in the week with given number*numWeek*. The number should be in range 1...53 and FALSE will be returned if the specified date doesn't exist. TRUE is returned if the date was changed successfully.

wxDateTime::GetWeek

wxDateTime GetWeek(**wxDateTime_t** *numWeek*, **WeekDay** *weekday* = *Mon*) **const**

Returns the copy of this object to which*SetToTheWeek* (p. 240) was applied.

wxDateTime::SetToLastMonthDay

wxDateTime& SetToLastMonthDay(**Month** *month* = *Inv_Month*, **int** *year* = *Inv_Year*)

Sets the date to the last day in the specified month (the current one by default).

Returns the reference to the modified object itself.

wxDateTime::GetLastMonthDay

wxDateTime GetLastMonthDay(**Month** *month* = *Inv_Month*, **int** *year* = *Inv_Year*) **const**

Returns the copy of this object to which*SetToLastMonthDay* (p. 241) was applied.

wxDateTime::SetToYearDay

wxDateTime& SetToYearDay(**wxDateTime_t** *yday*)

Sets the date to the day number *yday* in the same year (i.e., unlike the other functions, this one does not use the current year). The day number should be in the range 1...366 for the leap years and 1...365 for the other ones.

Returns the reference to the modified object itself.

wxDateTime::GetYearDay

wxDateTime GetYearDay(**wxDateTime_t** *yday*) **const**

Returns the copy of this object to which*SetToYearDay* (p. 241) was applied.

wxDateTime::GetJulianDayNumber

double GetJulianDayNumber() **const**

Returns the *JDN* (p. 229) corresponding to this date. Beware of rounding errors!

See also

GetModifiedJulianDayNumber (p. 242)

wxDateTime::GetJDN

double GetJDN() **const**

Synonym for *GetJulianDayNumber* (p. 242).

wxDateTime::GetModifiedJulianDayNumber

double GetModifiedJulianDayNumber() **const**

Returns the *Modified Julian Day Number* (MJD) which is, by definition, equal to JDN - 2400000.5. The MJDs are simpler to work with as the integral MJDs correspond to midnights of the dates in the Gregorian calendar and not th noons like JDN. The MJD 0 is Nov 17, 1858.

wxDateTime::GetMJD

double GetMJD() **const**

Synonym for *GetModifiedJulianDayNumber* (p. 242).

wxDateTime::GetRataDie

double GetRataDie() **const**

Return the *Rata Die number* of this date.

By definition, the Rata Die number is a date specified as the number of days relative to a base date of December 31 of the year 0. Thus January 1 of the year 1 is Rata Die day 1.

wxDateTime::ToTimezone

wxDateTime ToTimezone(**const TimeZone&** *tz*, **bool** *noDST = FALSE*) **const**

Transform the date to the given time zone. If *noDST* is TRUE, no DST adjustments will be made.

Returns the date in the new time zone.

wxDateTime::MakeTimezone

wxDateTime& MakeTimezone(**const TimeZone&** *tz*, **bool** *noDST = FALSE*)

Modifies the object in place to represent the date in another time zone. If *noDST* is TRUE, no DST adjustments will be made.

wxDateTime::ToGMT

wxDateTime ToGMT(**bool** *noDST = FALSE*) **const**

This is the same as calling *ToTimezone* (p. 242) with the argument GMT0.

wxDateTime::MakeGMT

wxDateTime& MakeGMT(**bool** *noDST = FALSE*)

This is the same as calling *MakeTimezone* (p. 243) with the argument GMT0.

wxDateTime::IsDST

int IsDST(**Country** *country = Country_Default*) **const**

Returns TRUE if the DST is applied for this date in the given country.

See also

GetBeginDST (p. 223) and *GetEndDST* (p. 224)

wxDateTimeHolidayAuthority

TODO

wxDateTimeWorkDays

TODO

wxDb

A wxDb instance is a connection to an ODBC data source which may be opened, closed, and re-opened an unlimited number of times. A database connection allows function to be performed directly on the data source, as well as allowing access to any tables/views defined in the data source to which the user has sufficient privileges.

Include files

<wx/db.h>

Helper classes and data structures

The following classes and structs are defined in db.cpp/.h for use with the wxDb class.

- *wxDbColFor* (p. 267)
- *wxDbColInf* (p. 267)
- *wxDbTableInf* (p. 282)
- *wxDbInf* (p. 267)

Constants

NOTE: In a future release, all ODBC class constants will be prefaced with 'wx'

```
    wxDB_PATH_MAX           Maximum path length allowed to be passed to
the ODBC
                            driver to indicate where the data file is
located.

    DB_MAX_COLUMN_NAME_LEN  Maximum supported length for the name of a
column

    DB_MAX_ERROR_HISTORY    Maximum number of error messages retained
in the
                            queue before being overwritten by new
errors.

    DB_MAX_ERROR_MSG_LEN    Maximum supported length of an error
message returned
                            by the ODBC classes

    DB_MAX_STATEMENT_LEN    Maximum supported length for a complete SQL
statement
                            to be passed to the ODBC driver

    DB_MAX_TABLE_NAME_LEN   Maximum supported length for the name of a
```

```
table
```

```
    DB_MAX_WHERE_CLAUSE_LEN Maximum supported WHERE clause length that
can be
                                passed to the ODBC driver

    DB_TYPE_NAME_LEN        Maximum length of the name of a column's
data type
```

Enumerated types

enum wxDbSqlLogState
sqlLogOFF, sqlLogON

enum wxDBMS

These are the databases currently tested and working with the ODBC classes. A call to
wxDb::Dbms (p. 265) will return one of these enumerated values listed below.

```
        dbmsUNIDENTIFIED,
        dbmsORACLE,
        dbmsSYBASE_ASA,     // Adaptive Server Anywhere
        dbmsSYBASE_ASE,     // Adaptive Server Enterprise
        dbmsMS_SQL_SERVER,
        dbmsMY_SQL,
        dbmsPOSTGRES,
        dbmsACCESS,
        dbmsDBASE,
        dbmsINFORMIX
```

See the remarks in *wxDb::Dbms* (p. 265) for exceptions/issues with each of these
database engines.

Public member variables

SWORD wxDb::cbErrorMsg
This member variable is populated as a result of calling *wxDb::GetNextError* (p.
260). Contains the count of bytes in the wxDb::errorMsg string.

int wxDb::DB_STATUS
The last ODBC error that occurred on this data connection. Possible codes are:

```
  DB_ERR_GENERAL_WARNING                     // SqlState = '01000'
  DB_ERR_DISCONNECT_ERROR                    // SqlState = '01002'
  DB_ERR_DATA_TRUNCATED                      // SqlState = '01004'
  DB_ERR_PRIV_NOT_REVOKED                    // SqlState = '01006'
  DB_ERR_INVALID_CONN_STR_ATTR               // SqlState = '01S00'
  DB_ERR_ERROR_IN_ROW                        // SqlState = '01S01'
  DB_ERR_OPTION_VALUE_CHANGED                // SqlState = '01S02'
  DB_ERR_NO_ROWS_UPD_OR_DEL                  // SqlState = '01S03'
  DB_ERR_MULTI_ROWS_UPD_OR_DEL               // SqlState = '01S04'
  DB_ERR_WRONG_NO_OF_PARAMS                  // SqlState = '07001'
  DB_ERR_DATA_TYPE_ATTR_VIOL                 // SqlState = '07006'
  DB_ERR_UNABLE_TO_CONNECT                   // SqlState = '08001'
```

```
DB_ERR_CONNECTION_IN_USE                    // SqlState = '08002'
DB_ERR_CONNECTION_NOT_OPEN                  // SqlState = '08003'
DB_ERR_REJECTED_CONNECTION                  // SqlState = '08004'
DB_ERR_CONN_FAIL_IN_TRANS                   // SqlState = '08007'
DB_ERR_COMM_LINK_FAILURE                    // SqlState = '08S01'
DB_ERR_INSERT_VALUE_LIST_MISMATCH           // SqlState = '21S01'
DB_ERR_DERIVED_TABLE_MISMATCH               // SqlState = '21S02'
DB_ERR_STRING_RIGHT_TRUNC                   // SqlState = '22001'
DB_ERR_NUMERIC_VALUE_OUT_OF_RNG             // SqlState = '22003'
DB_ERR_ERROR_IN_ASSIGNMENT                  // SqlState = '22005'
DB_ERR_DATETIME_FLD_OVERFLOW                // SqlState = '22008'
DB_ERR_DIVIDE_BY_ZERO                       // SqlState = '22012'
DB_ERR_STR_DATA_LENGTH_MISMATCH             // SqlState = '22026'
DB_ERR_INTEGRITY_CONSTRAINT_VIOL            // SqlState = '23000'
DB_ERR_INVALID_CURSOR_STATE                 // SqlState = '24000'
DB_ERR_INVALID_TRANS_STATE                  // SqlState = '25000'
DB_ERR_INVALID_AUTH_SPEC                    // SqlState = '28000'
DB_ERR_INVALID_CURSOR_NAME                  // SqlState = '34000'
DB_ERR_SYNTAX_ERROR_OR_ACCESS_VIOL          // SqlState = '37000'
DB_ERR_DUPLICATE_CURSOR_NAME                // SqlState = '3C000'
DB_ERR_SERIALIZATION_FAILURE                // SqlState = '40001'
DB_ERR_SYNTAX_ERROR_OR_ACCESS_VIOL2         // SqlState = '42000'
DB_ERR_OPERATION_ABORTED                    // SqlState = '70100'
DB_ERR_UNSUPPORTED_FUNCTION                 // SqlState = 'IM001'
DB_ERR_NO_DATA_SOURCE                       // SqlState = 'IM002'
DB_ERR_DRIVER_LOAD_ERROR                    // SqlState = 'IM003'
DB_ERR_SQLALLOCENV_FAILED                   // SqlState = 'IM004'
DB_ERR_SQLALLOCCONNECT_FAILED               // SqlState = 'IM005'
DB_ERR_SQLSETCONNECTOPTION_FAILED           // SqlState = 'IM006'
DB_ERR_NO_DATA_SOURCE_DLG_PROHIB            // SqlState = 'IM007'
DB_ERR_DIALOG_FAILED                        // SqlState = 'IM008'
DB_ERR_UNABLE_TO_LOAD_TRANSLATION_DLL       // SqlState = 'IM009'
DB_ERR_DATA_SOURCE_NAME_TOO_LONG            // SqlState = 'IM010'
DB_ERR_DRIVER_NAME_TOO_LONG                 // SqlState = 'IM011'
DB_ERR_DRIVER_KEYWORD_SYNTAX_ERROR          // SqlState = 'IM012'
DB_ERR_TRACE_FILE_ERROR                     // SqlState = 'IM013'
DB_ERR_TABLE_OR_VIEW_ALREADY_EXISTS         // SqlState = 'S0001'
DB_ERR_TABLE_NOT_FOUND                      // SqlState = 'S0002'
DB_ERR_INDEX_ALREADY_EXISTS                 // SqlState = 'S0011'
DB_ERR_INDEX_NOT_FOUND                      // SqlState = 'S0012'
DB_ERR_COLUMN_ALREADY_EXISTS                // SqlState = 'S0021'
DB_ERR_COLUMN_NOT_FOUND                     // SqlState = 'S0022'
DB_ERR_NO_DEFAULT_FOR_COLUMN                // SqlState = 'S0023'
DB_ERR_GENERAL_ERROR                        // SqlState = 'S1000'
DB_ERR_MEMORY_ALLOCATION_FAILURE            // SqlState = 'S1001'
DB_ERR_INVALID_COLUMN_NUMBER                // SqlState = 'S1002'
DB_ERR_PROGRAM_TYPE_OUT_OF_RANGE            // SqlState = 'S1003'
DB_ERR_SQL_DATA_TYPE_OUT_OF_RANGE           // SqlState = 'S1004'
DB_ERR_OPERATION_CANCELLED                  // SqlState = 'S1008'
DB_ERR_INVALID_ARGUMENT_VALUE               // SqlState = 'S1009'
DB_ERR_FUNCTION_SEQUENCE_ERROR              // SqlState = 'S1010'
DB_ERR_OPERATION_INVALID_AT_THIS_TIME       // SqlState = 'S1011'
DB_ERR_INVALID_TRANS_OPERATION_CODE         // SqlState = 'S1012'
DB_ERR_NO_CURSOR_NAME_AVAIL                 // SqlState = 'S1015'
DB_ERR_INVALID_STR_OR_BUF_LEN               // SqlState = 'S1090'
DB_ERR_DESCRIPTOR_TYPE_OUT_OF_RANGE         // SqlState = 'S1091'
DB_ERR_OPTION_TYPE_OUT_OF_RANGE             // SqlState = 'S1092'
```

```
    DB_ERR_INVALID_PARAM_NO                          // SqlState = 'S1093'
    DB_ERR_INVALID_SCALE_VALUE                       // SqlState = 'S1094'
    DB_ERR_FUNCTION_TYPE_OUT_OF_RANGE                // SqlState = 'S1095'
    DB_ERR_INF_TYPE_OUT_OF_RANGE                     // SqlState = 'S1096'
    DB_ERR_COLUMN_TYPE_OUT_OF_RANGE                  // SqlState = 'S1097'
    DB_ERR_SCOPE_TYPE_OUT_OF_RANGE                   // SqlState = 'S1098'
    DB_ERR_NULLABLE_TYPE_OUT_OF_RANGE                // SqlState = 'S1099'
    DB_ERR_UNIQUENESS_OPTION_TYPE_OUT_OF_RANGE // SqlState = 'S1100'
    DB_ERR_ACCURACY_OPTION_TYPE_OUT_OF_RANGE    // SqlState = 'S1101'
    DB_ERR_DIRECTION_OPTION_OUT_OF_RANGE             // SqlState = 'S1103'
    DB_ERR_INVALID_PRECISION_VALUE                   // SqlState = 'S1104'
    DB_ERR_INVALID_PARAM_TYPE                        // SqlState = 'S1105'
    DB_ERR_FETCH_TYPE_OUT_OF_RANGE                   // SqlState = 'S1106'
    DB_ERR_ROW_VALUE_OUT_OF_RANGE                    // SqlState = 'S1107'
    DB_ERR_CONCURRENCY_OPTION_OUT_OF_RANGE      // SqlState = 'S1108'
    DB_ERR_INVALID_CURSOR_POSITION                   // SqlState = 'S1109'
    DB_ERR_INVALID_DRIVER_COMPLETION                 // SqlState = 'S1110'
    DB_ERR_INVALID_BOOKMARK_VALUE                    // SqlState = 'S1111'
    DB_ERR_DRIVER_NOT_CAPABLE                        // SqlState = 'S1C00'
    DB_ERR_TIMEOUT_EXPIRED                           // SqlState = 'S1T00'
```

struct **wxDb::dbInf**

This structure is internal to the wxDb class and contains details of the ODBC datasource that the current instance of the wxDb is connected to in its members. When the data source is opened, all of the information contained in the dbInf structure is queried from the data source. This information is used almost exclusively within the ODBC class library. Where there is a need for this information outside of the class library a member function such as wxDbTable::IsCursorClosedOnCommit() has been added for ease of use.

```
    char   dbmsName[40]        - Name of the dbms product
    char   dbmsVer[64]         - Version # of the dbms product
    char   driverName[40]      - Driver name
    char   odbcVer[60]         - ODBC version of the driver
    char   drvMgrOdbcVer[60]   - ODBC version of the driver manager
    char   driverVer[60]       - Driver version
    char   serverName[80]      - Server Name, typically a connect string
    char   databaseName[128]   - Database filename
    char   outerJoins[2]       - Does datasource support outer joins
    char   procedureSupport[2] - Does datasource support stored
procedures
    UWORD  maxConnections      - Maximum # of connections datasource
supports
    UWORD  maxStmts            - Maximum # of HSTMTs per HDBC
    UWORD  apiConfLvl          - ODBC API conformance level
    UWORD  cliConfLvl          - Is datasource SAG compliant
    UWORD  sqlConfLvl          - SQL conformance level
    UWORD  cursorCommitBehavior   - How cursors are affected on db
commit
    UWORD  cursorRollbackBehavior - How cursors are affected on db
rollback
    UWORD  supportNotNullClause   - Does datasource support NOT NULL
clause
    char   supportIEF[2]       - Integrity Enhancement Facility (Ref.
Integrity)
    UDWORD txnIsolation        - Transaction isolation level supported
```

```
by driver
    UDWORD txnIsolationOptions - Transaction isolation level options
available
    UDWORD fetchDirections    - Fetch directions supported
    UDWORD lockTypes          - Lock types supported in SQLSetPos
    UDWORD posOperations      - Position operations supported in
SQLSetPos
    UDWORD posStmts           - Position statements supported
    UDWORD scrollConcurrency  - Scrollable cursor concurrency options
supported
    UDWORD scrollOptions      - Scrollable cursor options supported
    UDWORD staticSensitivity  - Can additions/deletions/updates be
detected
    UWORD  txnCapable         - Indicates if datasource supports
transactions
    UDWORD loginTimeout       - Number seconds to wait for a login
request
```

*char **wxDb::errorList**[DB_MAX_ERROR_HISTORY][DB_MAX_ERROR_MSG_LEN]*
      The last n ODBC errors that have occurred on this database connection.

*char **wxDb::errorMsg**[SQL_MAX_MESSAGE_LENGTH]*
      This member variable is populated as a result of calling *wxDb::GetNextError* (p. 260). It contains the ODBC error message text.

*SDWORD **wxDb::nativeError***
      Set by wxDb::DispAllErrors, wxDb::GetNextError, and wxDb::DispNextError. It contains the datasource-specific error code returned by the datasource to the ODBC driver. Used for reporting ODBC errors.

*wxChar **wxDb::sqlState**[20]*
      Set by wxDb::TranslateSqlState(). Indicates the error state after a failed ODBC operation. Used for reporting ODBC errors.

Remarks

Default cursor scrolling is defined by wxODBC_FWD_ONLY_CURSORS in setup.h when the wxWindows library is built. This behavior can be overridden when an instance of a wxDb is created (see *wxDb constructor* (p. 249)).

See also

wxDbColFor (p. 267), *wxDbColInf* (p. 267), *wxDbTable* (p. 268), *wxDbTableInf* (p. 282), *wxDbInf* (p. 267)

Associated non-class functions

The following functions are used in conjunction with the wxDb class.

wxDb * wxDbGetConnection(**wxDbConnectInf ****pDbConfig*, **bool**
FwdOnlyCursors=(bool)wxODBC_FWD_ONLY_CURSORS)

bool wxDbFreeConnection(**wxDb** *pDb)

void wxDbCloseConnections()

int wxDbConnectionsInUse()

bool wxDbSqlLog(**wxDbSqlLogState** *state*, **const wxChar** *filename = *SQL_LOG_FILENAME*)

bool wxDbGetDataSource (**HENV** *henv*, **char** *Dsn, **SWORD** *DsnMax*, **char** *DsDesc, **SWORD** *DsDescMax*, **UWORD** *direction* = *SQL_FETCH_NEXT*)

wxDb::wxDb

 wxDb()

Default constructor.

 wxDb(**HENV&** *aHenv*, **bool** *FwdOnlyCursors=(bool)wxODBC_FWD_ONLY_CURSORS*)

Constructor, used to create an ODBC connection to a data source.

Parameters

aHenv
　　Environment handle used for this connection.

FwdOnlyCursors
　　Will cursors created for use with this datasource connection only allow forward
　　scrolling cursors.

Remarks

This is the constructor for the wxDb class. The wxDb object must be created and
opened before any database activity can occur.

Example

```
   wxDbConnectInf ConnectInf;
   ....Set values for member variables of ConnectInf here

   wxDb sampleDB(ConnectInf.Henv);
   if (!sampleDB.Open(ConnectInf.Dsn, ConnectInf.Uid,
ConnectInf.AuthStr))
   {
      // Error opening data source
```

        }

wxDb::Catalog

bool Catalog(**char** * *userID*, **char** **fileName = *SQL_CATALOG_FILENAME*)

Allows a data "dictionary" of the data source to be created, dumping pertinent
information about all data tables to which the user specified in userID has access.

Parameters

userID
>   Database user name to use in accessing the database. All tables to which this
>   user has rights will be evaluated in the catalog.

fileName
>   OPTIONAL argument. Name of the text file to create and write the DB catalog to.

Return value

Returns TRUE if the catalog request was successful, of FALSE if there was some
reason the catalog could not be generated

Example

```
============== ============== ================ ========= =======
TABLE NAME     COLUMN NAME    DATA TYPE        PRECISION  LENGTH
============== ============== ================ ========= =======
EMPLOYEE       RECID          (0008)NUMBER            15        8
EMPLOYEE       USER_ID        (0012)VARCHAR2          13       13
EMPLOYEE       FULL_NAME      (0012)VARCHAR2          26       26
EMPLOYEE       PASSWORD       (0012)VARCHAR2          26       26
EMPLOYEE       START_DATE     (0011)DATE              19       16
```

wxDb::Close

void Close()

Closes the database connection.

Remarks

At the end of your program, when you have finished all of your database work, you must
close the ODBC connection to the data source. There are actually four steps involved in
doing this as illustrated in the example.

Any wxDbTable instances which use this connection must be deleted before closing the
database connection.

Example

```
// Commit any open transactions on the data source
sampleDB.CommitTrans();

// Delete any remaining wxDbTable objects allocated with new
delete parts;

// Close the wxDb connection when finished with it
sampleDB.Close();

// Free Environment Handle that ODBC uses
if (SQLFreeEnv(Db.Henv) != SQL_SUCCESS)
{
    // Error freeing environment handle
}
```

wxDb::CommitTrans

bool CommitTrans()

Permanently "commits" changes (insertions/deletions/updates) to the database.

Return value

Returns TRUE if the commit was successful, or FALSE if the commit failed.

Remarks

Transactions begin implicitly as soon as you make a change to the database. At any time thereafter, you can save your work to the database ("Commit") or roll back all of your changes ("Rollback"). Calling this member function commits all open transactions on this ODBC connection.

Special Note : *Cursors*

It is important to understand that different database/ODBC driver combinations handle transactions differently. One thing in particular that you must pay attention to is cursors, in regard to transactions. Cursors are what allow you to scroll through records forward and backward and to manipulate records as you scroll through them. When you issue a query, a cursor is created behind the scenes. The cursor keeps track of the query and keeps track of the current record pointer. After you commit or rollback a transaction, the cursor may be closed automatically. This means you must requery the data source before you can perform any additional work against the wxDbTable object. This is only necessary however if the data source closes the cursor after a commit or rollback. Use the wxDbTable::IsCursorClosedOnCommit() member function to determine the data source's transaction behavior. Note, it would be very inefficient to just assume the data source closes the cursor and always requery. This could put a significant, unnecessary load on data sources that leave the cursors open after a transaction.

wxDb::CreateView

bool CreateView(**char** * *viewName*, **char** * *colList*, **char** **pSqlStmt)

Creates a SQL VIEW.

Parameters

viewName
> The name of the view. e.g. PARTS_V

colList
> *OPTIONAL* Pass in a comma delimited list of column names if you wish to explicitly name each column in the result set. If not desired, pass in an empty string.

pSqlStmt
> Pointer to the select statement portion of the CREATE VIEW statement. Must be a complete, valid SQL SELECT statement.

Remarks

A 'view' is a logical table that derives columns from one or more other tables or views. Once the view is created, it can be queried exactly like any other table in the database.

NOTE: Views are not available with all datasources. Oracle is one example of a datasouce which does support views.

Example

```
// Incomplete code sample
db.CreateView("PARTS_SD1", "PN, PD, QTY",
              "SELECT PART_NO, PART_DESC, QTY_ON_HAND * 1.1 FROM
PARTS \
              WHERE STORAGE_DEVICE = 1");

// PARTS_SD1 can now be queried just as if it were a data table.
// e.g. SELECT PN, PD, QTY FROM PARTS_SD1
```

wxDb::DispAllErrors

bool DispAllErrors(**HENV** *aHenv*, *HDBC* aHdbc = SQL_NULL_HDBC, *HSTMT* aHstmt = SQL_NULL_HSTMT)

Logs all database errors that occurred as a result of the last executed database command. This logging also includes debug logging when compiled in debug mode via *wxLogDebug* (p. 1305). If logging is turned on via *wxDb::SetSqlLogging* (p. 263), then an entry is also logged to the defined log file.

Parameters

aHenv

> A handle to the ODBC environment.

aHdbc

> A handle to the ODBC connection. Pass this in if the ODBC function call that erred out required a hdbc or hstmt argument.

AHstmt

> A handle to the ODBC statement being executed against. Pass this in if the ODBC function call that erred out required a hstmt argument.

Remarks

This member function will display all of the ODBC error messages for the last ODBC function call that was made. Normally used internally within the ODBC class library. Would be used externally if calling ODBC functions directly (i.e. SQLFreeEnv()).

See also

wxDb::SetSqlLogging (p. 263), wxDbSqlLog

Example

```
   if (SQLExecDirect(hstmt, (UCHAR FAR *) pSqlStmt, SQL_NTS) !=
SQL_SUCCESS)
       // Display all ODBC errors for this stmt
       return(db.DispAllErrors(db.henv, db.hdbc, hstmt));
```

wxDb::DispNextError

void DispNextError()

Remarks

This function is normally used internally within the ODBC class library. It could be used externally if calling ODBC functions directly. This function works in conjunction with *wxDb::GetNextError* (p. 260) when errors (or sometimes informational messages) returned from ODBC need to be analyzed rather than simply displaying them as an error. GetNextError() retrieves the next ODBC error from the ODBC error queue. The wxDb member variables "sqlState", "nativeError" and "errorMsg" could then be evaluated. To display the error retrieved, DispNextError() could then be called. The combination of GetNextError() and DispNextError() can be used to iteratively step through the errors returned from ODBC evaluating each one in context and displaying the ones you choose.

Example

```
   // Drop the table before attempting to create it
   sprintf(sqlStmt, "DROP TABLE %s", tableName);
```

```
    // Execute the drop table statement
    if (SQLExecDirect(hstmt,(UCHAR FAR *)sqlStmt,SQL_NTS) !=
SQL_SUCCESS)
    {
        // Check for sqlState = S0002, "Table or view not found".
        // Ignore this error, bomb out on any other error.
        pDb->GetNextError(henv, hdbc, hstmt);
        if (strcmp(pDb->sqlState, "S0002"))
        {
            pDb->DispNextError();   // Displayed error retrieved
            pDb->DispAllErrors(henv, hdbc, hstmt); // Display all other
errors, if any
            pDb->RollbackTrans();   // Rollback the transaction
            CloseCursor();          // Close the cursor
            return(FALSE);          // Return Failure
        }
    }
```

wxDb::DropView

bool DropView(**const char** *viewName)

Drops the data table view named in 'viewName'.

Parameters

viewName
Name of the view to be dropped.

Remarks

If the view does not exist, this function will return TRUE. Note that views are not
supported with all data sources.

wxDb::ExecSql

bool ExecSql(**char** *pSqlStmt)

Allows a native SQL command to be executed directly against the datasource. In
addition to being able to run any standard SQL command, use of this function allows a
user to (potentially) utilize features specific to the datasource they are connected to that
may not be available through ODBC. The ODBC driver will pass the specified command
directly to the datasource.

Parameters

pSqlStmt
Pointer to the SQL statement to be executed.

Remarks

This member extends the wxDb class and allows you to build and execute ANY VALID SQL statement against the data source. This allows you to extend the class library by being able to issue any SQL statement that the data source is capable of processing.

See also

wxDb::GetData (p. 257), *wxDb::GetNext* (p. 260)

wxDb::FwdOnlyCursors

bool FwdOnlyCursors()

Indicates whether this connection to the datasource only allows forward scrolling cursors or not. This state is set at connection creation time.

Remarks

In wxWindows v2.4 release, this function will be deprecated to use a renamed version of the function called wxDb::IsFwdOnlyCursors() to match the normal wxWindows naming conventions for class member functions.

See also

wxDb::IsFwdOnlyCursors (p. 262), *wxDb::wxDb* (p. 249), *wxDbGetConnection* (p. 248)

wxDb::GetCatalog

wxDbInf * GetCatalog(char *userID)

Returns a wxDbInf pointer that points to the catalog(data source) name, schema, number of tables accessible to the current user, and a wxDbTableInf pointer to all data pertaining to all tables in the users catalog.

Parameters

userID
> Owner of the table. Specify a userID when the datasource you are connected to allows multiple unique tables with the same name to be owned by different users. *userID* is evaluated as follows:

```
userID == NULL  ... UserID is ignored (DEFAULT)
userID == ""    ... UserID set equal to 'this->uid'
userID != ""    ... UserID set equal to 'userID'
```

Remarks

The returned catalog will only contain catalog entries for tables to which the user specified in 'userID' has sufficient privileges. If no user is specified (NULL passed in), a

catalog pertaining to all tables in the datasource accessible via this connection will be
returned.

wxDb::GetColumnCount

int GetColumnCount(**char** *tableName, **const char** *userID)

Parameters

tableName
> A table name you wish to obtain column information about.

userID
> Name of the user that owns the table(s). Required for some datasources for
> situations where there may be multiple tables with the same name in the
> datasource, but owned by different users. *userID* is evaluated in the following
> manner:

```
userID == NULL  ... UserID is ignored (DEFAULT)
userID == ""    ... UserID set equal to 'this->uid'
userID != ""    ... UserID set equal to 'userID'
```

Return value

Returns a count of how many columns are in the specified table. If an error occurs
retrieving the number of columns the function will return a -1.

wxDb::GetColumns

wxDbColInf * **GetColumns**(**char** *tableName, **int** *numCols, **const char**
**userID=NULL*)

wxDbColInf * **GetColumns**(**char** **tableName[]*, **const char** *userID)

Parameters

tableName
> A table name you wish to obtain column information about.
numCols
> A pointer to a integer which will hold a count of the number of columns returned by
> this function
tableName[]
> An array of pointers to table names you wish to obtain column information about.
> The last element of this array must be a NULL string.
userID
> Name of the user that owns the table(s). Required for some datasources for
> situations where there may be multiple tables with the same name in the
> datasource, but owned by different users. *userID* is evaluated in the following
> manner:

```
         userID == NULL  ... UserID is ignored (DEFAULT)
         userID == ""    ... UserID set equal to 'this->uid'
         userID != ""    ... UserID set equal to 'userID'
```

Return value

This function returns an array of wxDbColInf structures. This allows you to obtain information regarding the columns of your table(s). If no columns were found, or an error occurred, this pointer will be zero (null).

THE CALLING FUNCTION IS RESPONSIBLE FOR DELETING THE *wxDbColInf* MEMORY WHEN IT IS FINISHED WITH IT.

ALL column bindings associated with this wxDb instance are unbound by this function. This function should use its own wxDb instance to avoid undesired unbinding of columns.

See also

wxDbColInf (p. 267)

Example

```
char *tableList[] = {"PARTS", 0};
wxDbColInf *colInf = pDb->GetColumns(tableList);
if (colInf)
{
   // Use the column inf
   .......
   // Destroy the memory
   delete [] colInf;
}
```

wxDb::GetData

bool GetData(**UWORD** *colNo*, **SWORD** *cType*, **PTR** *pData*, **SDWORD** *maxLen*, **SDWORD FAR *** *cbReturned*)

Used to retrieve result set data without binding column values to memory variables (i.e. not using a wxDbTable instance to access table data).

Parameters

colNo
      Ordinal number of column in the result set to be returned.
cType
      The C data type that is to be returned.
pData
      Memory buffer which will hold the data returned by the call to this function.
maxLen

Maximum size of the buffer that will hold the returned value.
cbReturned

Pointer to the buffer containing the length of the actual data returned. If this value
comes back as SQL_NULL_DATA, then the GetData() call has failed.

See also

wxDb::GetNext (p. 260), *wxDb::ExecSql* (p. 254)

Example

```
SDWORD cb;
ULONG reqQty;
wxString sqlStmt;
sqlStmt = "SELECT SUM(REQUIRED_QTY - PICKED_QTY) FROM ORDER_TABLE
WHERE \
            PART_RECID = 1450 AND REQUIRED_QTY > PICKED_QTY";

// Perform the query
if (!pDb->ExecSql(sqlStmt.c_str()))
{
      // ERROR
      return(0);
}

// Request the first row of the result set
if (!pDb->GetNext())
{
      // ERROR
      return(0);
}

Read column #1 of this row of the result set and store the value
in 'reqQty'
if (!pDb->GetData(1, SQL_C_ULONG, &reqQty, 0, &cb))
{
      // ERROR
      return(0);
}

// Check for a NULL result
if (cb == SQL_NULL_DATA)
      return(0);
```

Remarks

When requesting multiple columns to be returned from the result set (for example, the
SQL query requested 3 columns be returned), the calls to GetData must request the
columns in ordinal sequence (1,2,3 or 1,3 or 2,3).

wxDb::GetDatabaseName

char * GetDatabaseName ()

Returns the name of the database engine.

wxDb::GetDataSource

char * GetDataSource ()

Returns the ODBC datasource name.

wxDb::GetHDBC

HDBC GetHDBC()

Returns the ODBC handle to the database connection.

wxDb::GetHENV

HENV GetHENV()

Returns the ODBC environment handle.

wxDb::GetHSTMT

HSTMT GetHSTMT()

Returns the ODBC statement handle associated with this database connection.

wxDb::GetKeyFields

int GetKeyFields(**char ***_tableName_, **wxDbColInf ***_colInf_, **int**_nocols_)

Used to determine which columns are members of primary or non-primary indexes on the specified table. If a column is a member of a foreign key for some other table, that information is detected also.

This function is primarily for use by the *wxDb::GetColumns* (p. 256) function, but may be called if desired from the client application.

Parameters

tableName
    Name of the table for which the columns will be evaluated as to their inclusion in any indexes.
colInf
    Data structure containing the column definitions (obtained with *wxDb::GetColumns*

(p. 256)). This function populates the PkCol, PkTableName, and FkTableName members of the colInf structure.

nocols
Number of columns defined in the instance of colInf.

Return value

Currently always returns TRUE.

See also

wxDbColInf (p. 267), *wxDb::GetColumns* (p. 256)

wxDb::GetNext

bool GetNext()

Requests the next row in the result set obtained by issueing a query through a direct request using wxDb::ExecSql().

See also

wxDb::ExecSql (p. 254), *wxDb::GetData* (p. 257)

wxDb::GetNextError

bool GetNextError(**HENV** *aHenv*, **HDBC** *aHdbc* = *SQL_NULL_HDBC*, **HSTMT** *aHstmt* = *SQL_NULL_HSTMT*)

Parameters

aHenv
A handle to the ODBC environment.
aHdbc
A handle to the ODBC connection. Pass this in if the ODBC function call that erred out required a hdbc or hstmt argument.
AHstmt
A handle to the ODBC statement being executed against. Pass this in if the ODBC function call that erred out requires a hstmt argument.

See also

wxDb::DispNextError (p. 253), *wxDb::DispAllErrors* (p. 252)

Example

```
   if (SQLExecDirect(hstmt, (UCHAR FAR *) pSqlStmt, SQL_NTS) !=
SQL_SUCCESS)
   {
```

```
      // Display all ODBC errors for this stmt
      return(db.DispAllErrors(db.henv, db.hdbc, hstmt));
   }
```

wxDb::GetPassword

char * GetPassword()

Returns the password used to connect to the datasource.

wxDb::GetTableCount

int GetTableCount()

Returns the number of wxDbTable() instances currently using this data source connection.

wxDb::GetUsername

char * GetUsername()

Returns the user name used to access the datasource.

wxDb::Grant

bool Grant(int *privileges*, char **tableName, char **userList = *"PUBLIC"*)

Use this member function to GRANT privileges to users for accessing tables in the datasource.

Parameters

privileges
>   Use this argument to select which privileges you want to grant. Pass
>   DB_GRANT_ALL to grant all privileges. To grant individual privileges pass one or
>   more of the following OR'd together:
```
      DB_GRANT_SELECT  = 1
      DB_GRANT_INSERT  = 2
      DB_GRANT_UPDATE  = 4
      DB_GRANT_DELETE  = 8
      DB_GRANT_ALL     = DB_GRANT_SELECT | DB_GRANT_INSERT |
                         DB_GRANT_UPDATE | DB_GRANT_DELETE
```

tableName
>   The name of the table you wish to grant privileges on.
userList
>   A comma delimited list of users to grant the privileges to. If this argument is not

passed in, the privileges will be given to the general PUBLIC.

Remarks

Some databases require user names to be specified in all capital letters (i.e. Oracle). This function does not automatically capitalize the user names passed in the comma-separated list. This is the responsibility of the calling routine.

Example

```
db.Grant(DB_GRANT_SELECT | DB_GRANT_INSERT, "PARTS", "mary, sue");
```

wxDb::IsFwdOnlyCursors

bool IsFwdOnlyCursors()

Indicates whether this connection to the datasource only allows forward scrolling cursors or not. This state is set at connection creation time.

Remarks

Added as of wxWindows v2.4 release, this function is a renamed version of wxDb::FwdOnlyCursors() to match the normal wxWindows naming conventions for class member functions.

This function is not available in versions prior to v2.4. You should use *wxDb::FwdOnlyCursors* (p. 255) for wxWindows versions priori to 2.4.

See also

wxDb::wxDb (p. 249), *wxDbGetConnection* (p. 248)

wxDb::IsOpen

bool IsOpen()

Indicates whether the database connection to the datasource is currently opened.

wxDb::Open

bool Open(char *Dsn, char *Uid, char *AuthStr)

Parameters

Dsn
> Data source name. The name of the ODBC data source as assigned when the data source is initially set up through the ODBC data source manager.

Uid

> User ID. The name (ID) of the user you wish to connect as to the data source.
> The user name (ID) determines what objects you have access to in the datasource
> and what datasource privileges you have. Privileges include being able to create
> new objects, update objects, delete objects and so on. Users and privileges are
> normally administered by the database administrator.

AuthStr

> The password associated witht the Uid.

Remarks

After a wxDb instance is created, it must then be opened. When opening a data source,
there must be hree pieces of information passed. The data source name, user name
(ID) and the password for the user. No database activity on the data source can be
performed until it is opened. This would normally be done at program startup and the
data source would remain open for the duration of the program run. Note: It is possible
to have multiple data sources open at the same time to support distributed database
connections.

Example

```
wxDb sampleDB(Db.Henv);
if (!sampleDB.Open("Oracle 7.1 HP/UX", "gtasker", "myPassword"))
{
   // Error opening data source
}
```

wxDb::RollbackTrans

bool RollbackTrans()

Function to "rollback" changes made to the database. After an insert/update/delete, the
operation may be "undone" by issuing this command any time before a
wxDb::CommitTrans (p. 251) is called on the database connection.

Remarks

Transactions begin implicitly as soon as you make a change to the database. At any
time thereafter, you can save your work to the database (using *wxDb::CommitTrans* (p.
251)) or undo all of your changes using this function.

> Calling this member function rolls back ALL open (uncommitted) transactions on this
> ODBC connection.

See also

wxDb::CommitTrans (p. 251) for a special note on cursors

wxDb::SetSqlLogging

bool SetSqlLogging(**wxDbSqlLogState** *state*, **const wxChar** **filename* = *SQL_LOG_FILENAME*, **bool** *append* = *FALSE*)

Parameters

state
> Either sqlLogOFF or sqlLogON (see *enum wxDbSqlLogState* (p. 267)). Turns logging of SQL commands sent to the data source OFF or ON.

filename
> *OPTIONAL.* Name of the file to which the log text is to be written.

append
> *OPTIONAL.* Whether the file is appended to or overwritten.

Remarks

When called with *sqlLogON*, all commands sent to the data source engine are logged to the file specified by *filename*. Logging is done by embedded WriteSqlLog() calls in the database member functions, or may be manually logged by adding calls to WriteSqlLog() in your own source code.

When called with *sqlLogOFF*, the logging file is closed, and any calls to WriteSqlLog() are ignored.

wxDb::TableExists

bool TableExists(**const char** **tableName*, **const char** **userID=NULL*, **const char** **path=NULL*)

Checks the ODBC data source for the existence of a table. If a *userID* is specified, then the table must be accessible by that user (user must have at least minimal privileges to the table).

Parameters

tableName
> Name of the table to check for the existence of

userID
> Owner of the table. Specify a userID when the datasource you are connected to allows multiple unique tables with the same name to be owned by different users. *userID*is evaluated as follows:

```
userID == NULL  ... UserID is ignored (DEFAULT)
userID == ""    ... UserID set equal to 'this->uid'
userID != ""    ... UserID set equal to 'userID'
```

Remarks

tableName may refer to a table, view, alias or synonym.

This function does not indicate whether or not the user has privileges to query or perform other functions on the table.

wxDb::TranslateSqlState

int TranslateSqlState(**const wxChar** *SQLState)

Parameters

SQLState
Converts an ODBC sqlstate to an internal error code.

Return value

Returns the internal class DB_ERR code. See *wxDb::DB_STATUS* (p. 244) definition.

wxDb::WriteSqlLog

bool WriteSqlLog(**const wxChar** *logMsg)

Parameters

logMsg
Free form string to be written to the log file.

Remarks

Very useful debugging tool that may be turned on/off during run time. The passed in string *logMsg* will be written to a log file if SQL logging is turned on (see *wxDb::SetSqlLogging* (p. 263) for details on turning logging on/off).

Return value

If SQL logging is off when a call to WriteSqlLog() is made, or there is a failure to write the log message to the log file, the function returns FALSE without performing the requested log, otherwise TRUE is returned.

See also

wxDb::SetSqlLogging (p. 263)

wxDb::Dbms

wxDBMS Dbms()

Remarks

The return value will be of the enumerated type wxDBMS. This enumerated type
contains a list of all the currently tested and supported databases.

Additional databases may be work with these classes, but these databases returned by
this function have been tested and confirmed to work with these ODBC classes.

enum wxDBMS includes:
```
dbmsUNIDENTIFIED
dbmsORACLE
dbmsSYBASE_ASA
dbmsSYBASE_ASE
dbmsMY_SQL_SERVER
dbmsMY_SQL
dbmsPOSTGRES
dbmsACCESS
dbmsDBASE
dbmsINFORMIX
```

There are known issues with conformance to the ODBC standards with several
datasources listed above. Please see the overview for specific details on which
datasource have which issues.

Return value

The return value will indicate which of the supported datasources is currently connected
to by this connection. In the event that the datasource is not recognized, a value of
'dbmsUNIDENTIFIED' is returned.

wxDb::SetDebugErrorMessages

void SetDebugErrorMessages(**bool** *state*)

state
     Either TRUE (debug messages are displayed) or FALSE (debug messages are not
     displayed.

Remarks

Turns on/off debug error messages from the ODBC class library. When this function is
passed TRUE, errors are reported to the user automatically in a text or pop-up dialog
when an ODBC error occurs. When passed FALSE, errors are silently handled.

When compiled in release mode (FINAL=1), this setting has no affect.

See also

wxDb constructor

wxDb::LogError

void LogError(**const char** *errMsg **const char** **SQLState=0*)

errMsg
    Free-form text to display describing the error to be logged.
SQLState
    Native SQL state error

Remarks

Calling this function will enter a log message in the error list maintained for the database connection. This log message is free form and can be anything the programmer wants to enter in the error list.

If SQL logging is turned on, the call to this function will also log the text into the SQL log file.

See also

wxDb::WriteSqlLog (p. 265)

wxDbColInf

Used with the *wxDb::GetColumns* (p. 256) functions for obtaining all retrievable information about a columns definition.

wxDbColFor

Beginning support for handling international formatting specifically on dates and floats.

Only one function is provided with this class currently:

wxDbColFor::Format

int Format(**int** *Nation*, **int** *dbDataType*, **SWORD** *sqlDataType*, **short** *columnSize*, **short** *decimalDigits*)

Work in progress, and should be inter-related with wxLocale

wxDbInf

Contains information regarding the database connection (data source name, number of tables, etc). A pointer to a wxDbTableInf is included in this class so a program can create a wxDbTableInf array instance to maintain all information about all tables in the datasource to have all the datasource's information in one memory structure.

wxDbTable

A wxDbTable instance provides re-usable access to rows of data in a table contained within the associated ODBC data source

Include files

<wx/dbtable.h>
<wx/db.h>

Helper classes and data structures

The following classes and structs are defined in dbtable.cpp/.h for use with the wxDbTable class.

```
    class wxDbColDef     : Bound column definitions for use by a
wxDbTable
                            instance

    class wxDbColDataPtr : Pointer to dynamic column definitions for
use with
                            a wxDbTable instance

    class wxDbIdxDef     : Used in creation of non-primary indexes
```

Constants

```
    wxDB_DEFAULT_CURSOR    Index number of the cursor that each table
will use
                            by default.

    wxDB_QUERY_ONLY        Used to indicate whether a table that is
opened is
                            for query only, or if insert/update/deletes
will
                            be performed on the table.  Less overhead
(cursors
                            and memory) are allocated for query only
tables, plus
                            read access times are faster with some
datasources.

    wxDB_ROWID_LEN         [Oracle specific] - Used when
CanUpdateByRowID() is
                            true.  Optimizes updates so they are faster
```

```
by
                                updating on the Oracle-specific ROWID
column rather

                                than some other index.


    wxDB_DISABLE_VIEW           Use to indicate when a database view should
not be

                                if a table is normally set up to use a
view.

                                [Currently unsupported.]
```

Remarks

See also

wxDbTable (p. 268)

wxDbTable::wxDbTable

 wxDbTable(**wxDb** *pwxDb, **const char** *tblName, **const int** *nCols*,**const char**
qryTblName = 0*, **bool*qryOnly = !wxDB_QUERY_ONLY*,**const char** **tblPath=NULL*)

Default constructor.

Parameters

pSqlStmt

typeOfDel

pWhereClause
    Default is 0.

wxDbTable::wxDbTable

virtual ~wxDbTable()

Virtual default destructor.

wxDbTable::BuildDeleteStmt

void BuildSelectStmt(**char** *pSqlStmt, **int** *typeOfDel*, **const char** **pWhereClause=0*)

Parameters

pSqlStmt

typeOfDel

pWhereClause
    Default is 0.

wxDbTable::BuildSelectStmt

void BuildSelectStmt(**char** *pSqlStmt, **int** *typeOfSelect*, **bool** *distinct*)

Parameters

pSqlStmt

typeOfSelect

distinct

wxDbTable::BuildUpdateStmt

void BuildSelectStmt(**char** *pSqlStmt, **int** *typeOfUpd*, **const char** **pWhereClause=0*)

Parameters

pSqlStmt

typeOfUpd

pWhereClause
    Default is 0.

wxDbTable::BuildWhereStmt

void BuildSelectStmt(**char** *pWhereClause, **int** *typeOfWhere*, **const char**
qualTableName=0*, **const char **useLikeComparison=FALSE*)

Parameters

pWhereClause

typeOfWhere

qualTableName
    Default is 0.

useLikeComparison
　　Default is FALSE.

wxDbTable::CanSelectForUpdate

bool CanSelectForUpdate()

Remarks

wxDbTable::CanUpdateByROWID

bool CanUpdateByROWID()

Remarks

wxDbTable::ClearMemberVars

void ClearMemberVars()

Remarks

wxDbTable::CloseCursor

bool CloseCursor(**HSTMT***cursor*)

Parameters

cursor

Remarks

wxDbTable::Count

ULONG Count(**const char** **args="*"*)

Parameters

args
　　Default is "*".

Remarks

wxDbTable::CreateIndex

bool CreateIndex(**const char** **idxName,* **bool***unique,* **int** *noIdxCols,* **wxDbIdxDef** **pIdxDefs,* **bool** *attemptDrop=TRUE*)

Parameters

idxName

unique

noIdxCols

pIdxDefs

attemptDrop
     Default is TRUE.

Remarks

wxDbTable::CreateTable

bool CreateTable(**bool** *attemptDrop=TRUE*)

Parameters

attemptDrop
     Default is TRUE.

Remarks

wxDbTable::DB_STATUS

bool DB_STATUS()

Accessor function for the private member variable DB_STATUS.

wxDbTable::IsColNull

bool IsColNull(**int** *colNo*)

Parameters

colNo

Remarks

wxDbTable::Delete

bool Delete()

Remarks

wxDbTable::DeleteCursor

bool DeleteCursor(**HSTMT** *hstmtDel*)

Parameters

hstmtDel

Remarks

wxDbTable::DeleteWhere

bool DeleteWhere(**const char** *pWhereClause)

Parameters

pWhereClause

Remarks

wxDbTable::DeleteMatching

bool DeleteMatching()

Remarks

wxDbTable::DropIndex

bool DropIndex(**const char** *idxName)

Parameters

idxName

Remarks

wxDbTable::DropTable

bool DropTable()

Remarks

wxDbTable::GetColDefs

wxDbColDef * GetColDefs()

Remarks

wxDbTable::GetCursor

HSTMT GetCursor()

Remarks

wxDbTable::GetDb

wxDb * GetDb()

Accessor function for the private member variable pDb which is a pointer to the datasource connection that this wxDbTable instance uses.

Remarks

wxDbTable::GetFirst

bool GetFirst()

Remarks

This function can only be used if the datasource connection used by the wxDbTable instance was created with FwdOnlyCursors set to FALSE. If the connection does not allow backward scrolling cursors, this function will return FALSE, and the data contained in the bound columns will be undefined.

See also

wxDb::FwdOnlyCursors (p. 255)

wxDbTable::GetFromClause

const char * GetFromClause()

Accessor function that returns the current FROM setting assigned with the *wxDbTable::SetFromClause* (p. 280).

wxDbTable::GetLast

bool GetLast()

Remarks

This function can only be used if the datasource connection used by the wxDbTable instance was created with FwdOnlyCursors set to FALSE. If the connection does not allow backward scrolling cursors, this function will return FALSE, and the data contained in the bound columns will be undefined.

See also

wxDb::FwdOnlyCursors (p. 255)

wxDbTable::GetNewCursor

HSTMT * GetNewCursor(**bool** *setCursor=FALSE*, **bool** *bindColumns=TRUE*)

Parameters

setCursor
    Default is FALSE.
bindColumns
    Default is TRUE.

Remarks

wxDbTable::GetNext

bool GetNext()

Remarks

wxDbTable::GetNumberOfColumns

bool GetNumberOfColumns()

Accessor function that returns the number of columns that are statically bound for access by the wxDbTable instance.

wxDbTable::GetOrderByClause

const char * GetOrderByClause()

Accessor function that returns the current ORDER BY setting assigned with the *wxDbTable::SetOrderByClause* (p. 280).

wxDbTable::GetPrev

bool GetPrev()

Remarks

This function can only be used if the datasource connection used by the wxDbTable instance was created with FwdOnlyCursors set to FALSE. If the connection does not allow backward scrolling cursors, this function will return FALSE, and the data contained in the bound columns will be undefined.

See also

wxDb::FwdOnlyCursors (p. 255)

wxDbTable::GetQueryTableName

const char * GetQueryTableName()

Remarks

wxDbTable::GetRowNum

UWORD GetRowNum()

Remarks

wxDbTable::GetTableName

const char * GetTableName()

Remarks

wxDbTable::GetTablePath

const char * GetTablePath()

Remarks

wxDbTable::GetWhereClause

const char * GetWhereClause()

Accessor function that returns the current WHERE setting assigned with the *wxDbTable::SetWhereClause* (p. 281)

wxDbTable::Insert

int Insert()

Remarks

wxDbTable::IsCursorClosedOnCommit

bool IsCursorClosedOnCommit()

Remarks

wxDbTable::IsQueryOnly

bool IsQueryOnly()

Accessor function that returns a value indicating if this wxDbTable instance was created to allow only queries to be performed on the bound columns. If this function returns TRUE, then no actions may be performed using this wxDbTable instance that would modify (insert/delete/update) the table's data.

wxDbTable::Open

bool Open()

Remarks

wxDbTable::Query

virtual bool Query(**bool** *forUpdate=FALSE*, **bool** *distinct=FALSE*)

Parameters

forUpdate
    Default is FALSE.
distinct
    Default is FALSE.

Remarks

wxDbTable::QueryBySqlStmt

bool QueryBySqlStmt(**const char** *pSqlStmt)

Parameters

pSqlStmt

Remarks

wxDbTable::QueryMatching

virtual bool QueryMatching(**bool***forUpdate=FALSE*, **bool***distinct=FALSE*)

Parameters

forUpdate
    Default is FALSE.
distinct
    Default is FALSE.

Remarks

wxDbTable::QueryOnKeyFields

bool QueryOnKeyFields(**bool***forUpdate=FALSE*, **bool***distinct=FALSE*)

Parameters

forUpdate
    Default is FALSE.
distinct
    Default is FALSE.

Remarks

wxDbTable::Refresh

bool Refresh()

Remarks

wxDbTable::SetColDefs

void SetColDefs(**int** *index*, **const char** *fieldName, **int** *dataType*, **void** *pData, **int** *cType*, **int** *size*, **bool** *keyField = FALSE*, **bool** *upd = TRUE*, **bool** *insAllow = TRUE*, **bool** *derivedCol = FALSE*)

wxDbColDataPtr * **SetColDefs**(**wxDbColInf** *colInfs, **ULONG** *numCols*)

Parameters

index

fieldName

dataType

pData

cType

 size

keyField
    Default is FALSE.
upd
    Default is TRUE.
insAllow
    Default is TRUE.
derivedCol
    Default is FALSE.

colInfs

numCols

Remarks

wxDbTable::SetCursor

bool Open(**HSTMT** **hstmtActivate = (void **) wxDB_DEFAULT_CURSOR*)

Parameters

hstmtActivate
> Default is wxDB_DEFAULT_CURSOR.

Remarks

wxDbTable::SetFromClause

void SetFromClause(**const wxString&***From*)

Parameters

From

wxDbTable::SetNull

bool SetNull(**int** *colNo*)

bool SetNull(**const char** *colName)

Parameters

colNo

colName

Remarks

wxDbTable::SetOrderByClause

void SetOrderByClause(**const wxString&***OrderBy*)

Parameters

OrderBy

wxDbTable::SetQueryTimeout

bool SetQueryTimeout(**UDWORD** *nSeconds*)

Parameters

nSeconds

Remarks

wxDbTable::SetWhereClause

void SetWhereClause(**const wxString&***Where*)

Parameters

Where

wxDbTable::Update

bool Update()

bool Update(**const char** **pSqlStmt)

Parameters

pSqlStmt

Remarks

wxDbTable::UpdateWhere

bool UpdateWhere(**const char** **pWhereClause)

Parameters

pWhereClause

Remarks

wxDbTable::operator ++

bool operator ++()

Same as *wxDbTable::GetNext* (p. 275)

See also

wxDbTable::GetNext (p. 275)

wxDbTable::operator --

bool operator –()

Same as *wxDbTable::GetPrev* (p. 276)

See also

wxDbTable::GetPrev (p. 276)

wxDbTableInf

Currently only used by wxDb::GetCatalog() internally and wxDbInf class, but may be used in future releases for user functions. Contains information describing the table (Name, type, etc). A pointer to a wxDbColInf array instance is included so a program can create a wxDbColInf array instance (using *wxDb::GetColumns* (p. 256)) to maintain all information about the columns of a table in one memory structure.

wxDC

A wxDC is a *device context* onto which graphics and text can be drawn. It is intended to represent a number of output devices in a generic way, so a window can have a device context associated with it, and a printer also has a device context. In this way, the same piece of code may write to a number of different devices, if the device context is used as a parameter.

Derived types of wxDC have documentation for specific features only, so refer to this section for most device context information.

Derived from

wxObject (p. 750)

Include files

<wx/dc.h>

See also

Overview (p. 1400)

wxDC::wxDC

wxDC()

Constructor.

wxDC::~wxDC

~wxDC()

Destructor.

wxDC::BeginDrawing

void BeginDrawing()

Allows optimization of drawing code under MS Windows. Enclose drawing primitives between **BeginDrawing** and **EndDrawing** calls.

Drawing to a wxDialog panel device context outside of a system-generated OnPaint event *requires* this pair of calls to enclose drawing code. This is because a Windows dialog box does not have a retained device context associated with it, and selections such as pen and brush settings would be lost if the device context were obtained and released for each drawing operation.

wxDC::Blit

bool Blit(**wxCoord** *xdest*, **wxCoord** *ydest*, **wxCoord** *width*, **wxCoord** *height*, **wxDC*** *source*, **wxCoord** *xsrc*, **wxCoord** *ysrc*, **int** *logicalFunc* = *wxCOPY*, **bool** *useMask* = *FALSE*)

Copy from a source DC to this DC, specifying the destination coordinates, size of area to copy, source DC, source coordinates, and logical function.

Parameters

xdest
　　Destination device context x position.

ydest
　　Destination device context y position.

width
　　Width of source area to be copied.

height

> Height of source area to be copied.

source

> Source device context.

xsrc

> Source device context x position.

ysrc

> Source device context y position.

logicalFunc

> Logical function to use: see *wxDC::SetLogicalFunction* (p. 297).

useMask

> If TRUE, Blit does a transparent blit using the mask that is associated with the bitmap selected into the source device context. The Windows implementation does the following:
>
> 1. Creates a temporary bitmap and copies the destination area into it.
>
> 2. Copies the source area into the temporary bitmap using the specified logical function.
>
> 3. Sets the masked area in the temporary bitmap to BLACK by ANDing the mask bitmap with the temp bitmap with the foreground colour set to WHITE and the bg colour set to BLACK.
>
> 4. Sets the unmasked area in the destination area to BLACK by ANDing the mask bitmap with the destination area with the foreground colour set to BLACK and the background colour set to WHITE.
>
> 5. ORs the temporary bitmap with the destination area.
>
> 6. Deletes the temporary bitmap.
>
> This sequence of operations ensures that the source's transparent area need not be black, and logical functions are supported.

Remarks

There is partial support for Blit in wxPostScriptDC, under X.

See *wxMemoryDC* (p. 682) for typical usage.

See also

wxMemoryDC (p. 682), *wxBitmap* (p. 54), *wxMask* (p. 663)

wxDC::CalcBoundingBox

void CalcBoundingBox(**wxCoord** *x*, **wxCoord** *y*)

Adds the specified point to the bounding box which can be retrieved with *MinX* (p. 295), *MaxX* (p. 295) and *MinY* (p. 295), *MaxY* (p. 295) functions.

See also

ResetBoundingBox (p. 295)

wxDC::Clear

void Clear()

Clears the device context using the current background brush.

wxDC::CrossHair

void CrossHair(**wxCoord** *x*, **wxCoord** *y*)

Displays a cross hair using the current pen. This is a vertical and horizontal line the height and width of the window, centred on the given point.

wxDC::DestroyClippingRegion

void DestroyClippingRegion()

Destroys the current clipping region so that none of the DC is clipped. See also *wxDC::SetClippingRegion* (p. 296).

wxDC::DeviceToLogicalX

wxCoord DeviceToLogicalX(**wxCoord** *x*)

Convert device X coordinate to logical coordinate, using the current mapping mode.

wxDC::DeviceToLogicalXRel

wxCoord DeviceToLogicalXRel(**wxCoord** *x*)

Convert device X coordinate to relative logical coordinate, using the current mapping mode. Use this function for converting a width, for example.

wxDC::DeviceToLogicalY

wxCoord DeviceToLogicalY(**wxCoord** *y*)

Converts device Y coordinate to logical coordinate, using the current mapping mode.

wxDC::DeviceToLogicalYRel

wxCoord DeviceToLogicalYRel(**wxCoord** *y*)

Convert device Y coordinate to relative logical coordinate, using the current mapping mode. Use this function for converting a height, for example.

wxDC::DrawArc

void DrawArc(**wxCoord** *x1*, **wxCoord** *y1*, **wxCoord** *x2*, **wxCoord** *y2*, **double** *xc*, **double** *yc*)

Draws an arc of a circle, centred on (*xc, yc*), with starting point (*x1, y1*) and ending at (*x2, y2*).   The current pen is used for the outline and the current brush for filling the shape.

The arc is drawn in an anticlockwise direction from the start point to the end point.

wxDC::DrawBitmap

void DrawBitmap(**const wxBitmap&** *bitmap*, **wxCoord** *x*, **wxCoord** *y*, **bool** *transparent*)

Draw a bitmap on the device context at the specified point. If *transparent* is TRUE and the bitmap has a transparency mask, the bitmap will be drawn transparently.

When drawing a mono-bitmap, the current text foreground colour will be used to draw the foreground of the bitmap (all bits set to 1), and the current text background colour to draw the background (all bits set to 0). See also *SetTextForeground* (p. 299), *SetTextBackground* (p. 299) and *wxMemoryDC* (p. 682).

wxDC::DrawCheckMark

void DrawCheckMark(**wxCoord** *x*, **wxCoord** *y*, **wxCoord** *width*, **wxCoord** *height*)

void DrawCheckMark(**const wxRect &***rect*)

Draws a check mark inside the given rectangle.

wxDC::DrawEllipse

void DrawEllipse(**wxCoord** *x*, **wxCoord** *y*, **wxCoord** *width*, **wxCoord** *height*)

Draws an ellipse contained in the rectangle with the given top left corner, and with the given size. The current pen is used for the outline and the current brush for filling the shape.

wxDC::DrawEllipticArc

void DrawEllipticArc(**wxCoord** *x*, **wxCoord** *y*, **wxCoord** *width*, **wxCoord** *height*, **double** *start*, **double** *end*)

Draws an arc of an ellipse. The current pen is used for drawing the arc and the current brush is used for drawing the pie.

x and *y* specify the x and y coordinates of the upper-left corner of the rectangle that contains the ellipse.

width and *height* specify the width and height of the rectangle that contains the ellipse.

start and *end* specify the start and end of the arc relative to the three-o'clock position from the center of the rectangle. Angles are specified in degrees (360 is a complete circle). Positive values mean counter-clockwise motion. If *start* is equal to *end*, a complete ellipse will be drawn.

wxDC::DrawIcon

void DrawIcon(**const wxIcon&** *icon*, **wxCoord** *x*, **wxCoord** *y*)

Draw an icon on the display (does nothing if the device context is PostScript). This can be the simplest way of drawing bitmaps on a window.

wxDC::DrawLine

void DrawLine(**wxCoord** *x1*, **wxCoord** *y1*, **wxCoord** *x2*, **wxCoord** *y2*)

Draws a line from the first point to the second. The current pen is used for drawing the line.

wxDC::DrawLines

void DrawLines(**int** *n*, **wxPoint** *points[]*, **wxCoord** *xoffset = 0*, **wxCoord** *yoffset = 0*)

void DrawLines(**wxList** **points*, **wxCoord** *xoffset = 0*, **wxCoord** *yoffset = 0*)

Draws lines using an array of *points* of size *n*, or list of pointers to points, adding the optional offset coordinate. The current pen is used for drawing the lines. The programmer is responsible for deleting the list of points.

wxPython note: The wxPython version of this method accepts a Python list of wxPoint objects.

wxDC::DrawPolygon

void DrawPolygon(**int** *n*, **wxPoint** *points[]*, **wxCoord** *xoffset = 0*, **wxCoord** *yoffset = 0*,
 int *fill_style = wxODDEVEN_RULE*)

void DrawPolygon(**wxList** **points*, **wxCoord** *xoffset = 0*, **wxCoord** *yoffset = 0*,
 int *fill_style = wxODDEVEN_RULE*)

Draws a filled polygon using an array of *points* of size *n*, or list of pointers to points, adding the optional offset coordinate.

The last argument specifies the fill rule: **wxODDEVEN_RULE** (the default) or **wxWINDING_RULE**.

The current pen is used for drawing the outline, and the current brush for filling the shape. Using a transparent brush suppresses filling. The programmer is responsible for deleting the list of points.

Note that wxWindows automatically closes the first and last points.

wxPython note: The wxPython version of this method accepts a Python list of wxPoint objects.

wxDC::DrawPoint

void DrawPoint(**wxCoord** *x*, **wxCoord** *y*)

Draws a point using the current pen.

wxDC::DrawRectangle

void DrawRectangle (**wxCoord** *x*, **wxCoord** *y*, **wxCoord** *width*, **wxCoord** *height*)

Draws a rectangle with the given top left corner, and with the given size. The current pen is used for the outline and the current brush for filling the shape.

wxDC::DrawRotatedText

void DrawRotatedText(**const wxString&** *text,* **wxCoord** *x,* **wxCoord** *y,* **double** *angle*)

Draws the text rotated by *angle* degrees.

See also

DrawText (p. 289)

wxDC::DrawRoundedRectangle

void DrawRoundedRectangle(**wxCoord** *x,* **wxCoord** *y,* **wxCoord** *width,* **wxCoord** *height,* **double** *radius = 20*)

Draws a rectangle with the given top left corner, and with the given size. The corners are quarter-circles using the given radius. The current pen is used for the outline and the current brush for filling the shape.

If *radius* is positive, the value is assumed to be the radius of the rounded corner. If *radius* is negative, the absolute value is assumed to be the *proportion* of the smallest dimension of the rectangle. This means that the corner can be a sensible size relative to the size of the rectangle, and also avoids the strange effects X produces when the corners are too big for the rectangle.

wxDC::DrawSpline

void DrawSpline(**wxList** **points*)

Draws a spline between all given control points, using the current pen. Doesn't delete the wxList and contents. The spline is drawn using a series of lines, using an algorithm taken from the X drawing program 'XFIG'.

void DrawSpline(**wxCoord** *x1,* **wxCoord** *y1,* **wxCoord** *x2,* **wxCoord** *y2,* **wxCoord** *x3,* **wxCoord** *y3*)

Draws a three-point spline using the current pen.

wxPython note: The wxPython version of this method accepts a Python list of wxPoint objects.

wxDC::DrawText

void DrawText(**const wxString&** *text,* **wxCoord** *x,* **wxCoord** *y*)

Draws a text string at the specified point, using the current text font, and the current text foreground and background colours.

The coordinates refer to the top-left corner of the rectangle bounding the string. See

wxDC::GetTextExtent (p. 293) for how to get the dimensions of a text string, which can be used to position the text more precisely.

NB: under wxGTK the current *logical function* (p. 292) is used by this function but it is ignored by wxMSW. Thus, you should avoid using logical functions with this function in portable programs.

wxDC::EndDoc

void EndDoc()

Ends a document (only relevant when outputting to a printer).

wxDC::EndDrawing

void EndDrawing()

Allows optimization of drawing code under MS Windows. Enclose drawing primitives between **BeginDrawing** and **EndDrawing** calls.

wxDC::EndPage

void EndPage()

Ends a document page (only relevant when outputting to a printer).

wxDC::FloodFill

void FloodFill(**wxCoord** *x*, **wxCoord** *y*, **const wxColour&** *colour*, **int** *style=wxFLOOD_SURFACE*)

Flood fills the device context starting from the given point, using the *current brush colour*, and using a style:

- wxFLOOD_SURFACE: the flooding occurs until a colour other than the given colour is encountered.
- wxFLOOD_BORDER: the area to be flooded is bounded by the given colour.

Note: this function is available in MS Windows only.

wxDC::GetBackground

wxBrush& GetBackground()

const wxBrush& GetBackground() **const**

Gets the brush used for painting the background (see *wxDC::SetBackground* (p. 296)).

wxDC::GetBackgroundMode

int GetBackgroundMode() const

Returns the current background mode: wxSOLID or wxTRANSPARENT.

See also

SetBackgroundMode (p. 296)

wxDC::GetBrush

wxBrush& GetBrush()

const wxBrush& GetBrush() const

Gets the current brush (see *wxDC::SetBrush* (p. 297)).

wxDC::GetCharHeight

wxCoord GetCharHeight()

Gets the character height of the currently set font.

wxDC::GetCharWidth

wxCoord GetCharWidth()

Gets the average character width of the currently set font.

wxDC::GetClippingBox

void GetClippingBox(wxCoord *x*, wxCoord *y*, wxCoord *width*, wxCoord *height*)

Gets the rectangle surrounding the current clipping region.

wxPython note: No arguments are required and the four values defining the rectangle are returned as a tuple.

wxDC::GetFont

wxFont& GetFont()

const wxFont& GetFont() **const**

Gets the current font (see *wxDC::SetFont* (p. 297)).

wxDC::GetLogicalFunction

int GetLogicalFunction()

Gets the current logical function (see *wxDC::SetLogicalFunction* (p. 297)).

wxDC::GetMapMode

int GetMapMode()

Gets the *mapping mode* for the device context (see *wxDC::SetMapMode* (p. 298)).

wxDC::GetOptimization

bool GetOptimization()

Returns TRUE if device context optimization is on. See *wxDC::SetOptimization* (p. 298) for details.

wxDC::GetPen

wxPen& GetPen()

const wxPen& GetPen() **const**

Gets the current pen (see *wxDC::SetPen* (p. 299)).

wxDC::GetPixel

bool GetPixel(**wxCoord** *x*, **wxCoord** *y*, **wxColour** *colour)

Sets *colour* to the colour at the specified location. Windows only; an X implementation is being worked on. Not available for wxPostScriptDC or wxMetafileDC.

wxPython note: For wxPython the wxColour value is returned and is not required as a parameter.

wxDC::GetSize

void GetSize(**wxCoord** *width, **wxCoord** *height)

For a PostScript device context, this gets the maximum size of graphics drawn so far on the device context.

For a Windows printer device context, this gets the horizontal and vertical resolution. It can be used to scale graphics to fit the page when using a Windows printer device context. For example, if *maxX* and *maxY* represent the maximum horizontal and vertical 'pixel' values used in your application, the following code will scale the graphic to fit on the printer page:

```
wxCoord w, h;
dc.GetSize(&w, &h);
double scaleX=(double)(maxX/w);
double scaleY=(double)(maxY/h);
dc.SetUserScale(min(scaleX,scaleY),min(scaleX,scaleY));
```

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

GetSize()	Returns a wxSize
GetSizeTuple()	Returns a 2-tuple (width, height)

wxDC::GetTextBackground

wxColour& GetTextBackground()

const wxColour& GetTextBackground() **const**

Gets the current text background colour (see *wxDC::SetTextBackground* (p. 299)).

wxDC::GetTextExtent

void GetTextExtent(**const wxString&** *string*, **wxCoord** *w, **wxCoord** *h, **wxCoord** *descent = *NULL*, **wxCoord** *externalLeading = *NULL*, **wxFont** *font = *NULL*)

Gets the dimensions of the string using the currently selected font. *string* is the text string to measure, *w* and *h* are the total width and height respectively, *descent* is the dimension from the baseline of the font to the bottom of the descender, and *externalLeading* is any extra vertical space added to the font by the font designer (usually is zero).

The optional parameter *font* specifies an alternative to the currently selected font: but note that this does not yet work under Windows, so you need to set a font for the device

context first.

See also *wxFont* (p. 437), *wxDC::SetFont* (p. 297).

wxPython note: The following methods are implemented in wxPython:

GetTextExtent(string) Returns a 2-tuple, (width, height)

GetFullTextExtent(string, font=NULL) Returns a 4-tuple, (width, height, descent, externalLeading)

wxDC::GetTextForeground

wxColour& GetTextForeground()

const wxColour& GetTextForeground() **const**

Gets the current text foreground colour (see *wxDC::SetTextForeground* (p. 299)).

wxDC::GetUserScale

void GetUserScale(**double** **x*, **double** **y*)

Gets the current user scale factor (set by *SetUserScale* (p. 299)).

wxDC::LogicalToDeviceX

wxCoord LogicalToDeviceX(**wxCoord** *x*)

Converts logical X coordinate to device coordinate, using the current mapping mode.

wxDC::LogicalToDeviceXRel

wxCoord LogicalToDeviceXRel(**wxCoord** *x*)

Converts logical X coordinate to relative device coordinate, using the current mapping mode. Use this for converting a width, for example.

wxDC::LogicalToDeviceY

wxCoord LogicalToDeviceY(**wxCoord** *y*)

Converts logical Y coordinate to device coordinate, using the current mapping mode.

wxDC::LogicalToDeviceYRel

wxCoord LogicalToDeviceYRel(wxCoord *y*)

Converts logical Y coordinate to relative device coordinate, using the current mapping mode. Use this for converting a height, for example.

wxDC::MaxX

wxCoord MaxX()

Gets the maximum horizontal extent used in drawing commands so far.

wxDC::MaxY

wxCoord MaxY()

Gets the maximum vertical extent used in drawing commands so far.

wxDC::MinX

wxCoord MinX()

Gets the minimum horizontal extent used in drawing commands so far.

wxDC::MinY

wxCoord MinY()

Gets the minimum vertical extent used in drawing commands so far.

wxDC::Ok

bool Ok()

Returns TRUE if the DC is ok to use.

wxDC::ResetBoundingBox

void ResetBoundingBox()

Resets the bounding box: after a call to this function, the bounding box doesn't contain

anything.

See also

CalcBoundingBox (p. 285)

wxDC::SetDeviceOrigin

void SetDeviceOrigin(wxCoord *x*, wxCoord *y*)

Sets the device origin (i.e., the origin in pixels after scaling has been applied).

This function may be useful in Windows printing operations for placing a graphic on a page.

wxDC::SetBackground

void SetBackground(const wxBrush& *brush*)

Sets the current background brush for the DC.

wxDC::SetBackgroundMode

void SetBackgroundMode(int *mode*)

mode may be one of wxSOLID and wxTRANSPARENT. This setting determines whether text will be drawn with a background colour or not.

wxDC::SetClippingRegion

void SetClippingRegion(wxCoord *x*, wxCoord *y*, wxCoord *width*, wxCoord *height*)

void SetClippingRegion(const wxRegion& *region*)

Sets the clipping region for the DC. The clipping region is an area to which drawing is restricted. Possible uses for the clipping region are for clipping text or for speeding up window redraws when only a known area of the screen is damaged.

See also

wxDC::DestroyClippingRegion (p. 285), *wxRegion* (p. 890)

wxDC::SetPalette

void SetPalette(const wxPalette& *palette*)

If this is a window DC or memory DC, assigns the given palette to the window or bitmap associated with the DC. If the argument is wxNullPalette, the current palette is selected out of the device context, and the original palette restored.

See *wxPalette* (p. 765) for further details.

wxDC::SetBrush

void SetBrush(**const wxBrush&** *brush*)

Sets the current brush for the DC.

If the argument is wxNullBrush, the current brush is selected out of the device context, and the original brush restored, allowing the current brush to be destroyed safely.

See also *wxBrush* (p. 80).

See also *wxMemoryDC* (p. 682) for the interpretation of colours when drawing into a monochrome bitmap.

wxDC::SetFont

void SetFont(**const wxFont&** *font*)

Sets the current font for the DC.

If the argument is wxNullFont, the current font is selected out of the device context, and the original font restored, allowing the current font to be destroyed safely.

See also *wxFont* (p. 437).

wxDC::SetLogicalFunction

void SetLogicalFunction(**int** *function*)

Sets the current logical function for the device context. This determines how a source pixel (from a pen or brush colour, or source device context if using *wxDC::Blit* (p. 283)) combines with a destination pixel in the current device context.

The possible values and their meaning in terms of source and destination pixel values are as follows:

```
wxAND                 src AND dst
wxAND_INVERT          (NOT src) AND dst
wxAND_REVERSE         src AND (NOT dst)
wxCLEAR               0
wxCOPY                src
```

```
wxEQUIV                (NOT src) XOR dst
wxINVERT               NOT dst
wxNAND                 (NOT src) OR (NOT dst)
wxNOR                  (NOT src) AND (NOT dst)
wxNO_OP                dst
wxOR                   src OR dst
wxOR_INVERT            (NOT src) OR dst
wxOR_REVERSE           src OR (NOT dst)
wxSET                  1
wxSRC_INVERT           NOT src
wxXOR                  src XOR dst
```

The default is wxCOPY, which simply draws with the current colour. The others combine the current colour and the background using a logical operation. wxINVERT is commonly used for drawing rubber bands or moving outlines, since drawing twice reverts to the original colour.

wxDC::SetMapMode

void SetMapMode(**int** *int*)

The *mapping mode* of the device context defines the unit of measurement used to convert logical units to device units. Note that in X, text drawing isn't handled consistently with the mapping mode; a font is always specified in point size. However, setting the *user scale* (see *wxDC::SetUserScale* (p. 299)) scales the text appropriately. In Windows, scaleable TrueType fonts are always used; in X, results depend on availability of fonts, but usually a reasonable match is found.

Note that the coordinate origin should ideally be selectable, but for now is always at the top left of the screen/printer.

Drawing to a Windows printer device context under UNIX uses the current mapping mode, but mapping mode is currently ignored for PostScript output.

The mapping mode can be one of the following:

wxMM_TWIPS	Each logical unit is 1/20 of a point, or 1/1440 of an inch.
wxMM_POINTS	Each logical unit is a point, or 1/72 of an inch.
wxMM_METRIC	Each logical unit is 1 mm.
wxMM_LOMETRIC	Each logical unit is 1/10 of a mm.
wxMM_TEXT	Each logical unit is 1 pixel.

wxDC::SetOptimization

void SetOptimization(**bool** *optimize*)

If *optimize* is TRUE (the default), this function sets optimization mode on. This currently means that under X, the device context will not try to set a pen or brush property if it is

known to be set already. This approach can fall down if non-wxWindows code is using the same device context or window, for example when the window is a panel on which the windowing system draws panel items. The wxWindows device context 'memory' will now be out of step with reality.

Setting optimization off, drawing, then setting it back on again, is a trick that must occasionally be employed.

wxDC::SetPen

void SetPen(**const wxPen&** *pen*)

Sets the current pen for the DC.

If the argument is wxNullPen, the current pen is selected out of the device context, and the original pen restored.

See also *wxMemoryDC* (p. 682) for the interpretation of colours when drawing into a monochrome bitmap.

wxDC::SetTextBackground

void SetTextBackground(**const wxColour&** *colour*)

Sets the current text background colour for the DC.

wxDC::SetTextForeground

void SetTextForeground(**const wxColour&** *colour*)

Sets the current text foreground colour for the DC.

See also *wxMemoryDC* (p. 682) for the interpretation of colours when drawing into a monochrome bitmap.

wxDC::SetUserScale

void SetUserScale(**double** *xScale*, **double** *yScale*)

Sets the user scaling factor, useful for applications which require 'zooming'.

wxDC::StartDoc

bool StartDoc(**const wxString&** *message*)

Starts a document (only relevant when outputting to a printer). Message is a message to show whilst printing.

wxDC::StartPage

bool StartPage()

Starts a document page (only relevant when outputting to a printer).

wxDDEClient

A wxDDEClient object represents the client part of a client-server DDE (Dynamic Data Exchange) conversation.

To create a client which can communicate with a suitable server, you need to derive a class from wxDDEConnection and another from wxDDEClient. The custom wxDDEConnection class will intercept communications in a 'conversation' with a server, and the custom wxDDEServer is required so that a user-overridden *wxDDEClient::OnMakeConnection* (p. 301) member can return a wxDDEConnection of the required class, when a connection is made.

This DDE-based implementation is available on Windows only, but a platform-independent, socket-based version of this API is available using *wxTCPClient* (p. 1066).

Derived from

wxClientBase
wxObject (p. 750)

Include files

<wx/dde.h>

See also

wxDDEServer (p. 305), *wxDDEConnection* (p. 301), *Interprocess communications overview* (p. 1438)

wxDDEClient::wxDDEClient

wxDDEClient()

Constructs a client object.

wxDDEClient::MakeConnection

wxConnectionBase * MakeConnection(**const wxString&** *host,* **const wxString&** *service,* **const wxString&** *topic*)

Tries to make a connection with a server specified by the host (machine name under UNIX, ignored under Windows), service name (must contain an integer port number under UNIX), and topic string. If the server allows a connection, a wxDDEConnection object will be returned. The type of wxDDEConnection returned can be altered by overriding the *wxDDEClient::OnMakeConnection* (p. 301) member to return your own derived connection object.

wxDDEClient::OnMakeConnection

wxConnectionBase * OnMakeConnection()

The type of *wxDDEConnection* (p. 301) returned from a *wxDDEClient::MakeConnection* (p. 301) call can be altered by deriving the **OnMakeConnection** member to return your own derived connection object. By default, a wxDDEConnection object is returned.

The advantage of deriving your own connection class is that it will enable you to intercept messages initiated by the server, such as *wxDDEConnection::OnAdvise* (p. 303). You may also want to store application-specific data in instances of the new class.

wxDDEClient::ValidHost

bool ValidHost(**const wxString&** *host*)

Returns TRUE if this is a valid host name, FALSE otherwise. This always returns TRUE under MS Windows.

wxDDEConnection

A wxDDEConnection object represents the connection between a client and a server. It can be created by making a connection using a *wxDDEClient* (p. 300) object, or by the acceptance of a connection by a *wxDDEServer* (p. 305) object. The bulk of a DDE (Dynamic Data Exchange) conversation is controlled by calling members in a **wxDDEConnection** object or by overriding its members.

An application should normally derive a new connection class from wxDDEConnection, in order to override the communication event handlers to do something interesting.

This DDE-based implementation is available on Windows only, but a platform-

independent, socket-based version of this API is available using *wxTCPConnection* (p. 1068).

Derived from

wxConnectionBase
wxObject (p. 750)

Include files

<wx/dde.h>

Types

wxIPCFormat is defined as follows:

```
enum wxIPCFormat
{
  wxIPC_INVALID =          0,
  wxIPC_TEXT =             1,  /* CF_TEXT */
  wxIPC_BITMAP =           2,  /* CF_BITMAP */
  wxIPC_METAFILE =         3,  /* CF_METAFILEPICT */
  wxIPC_SYLK =             4,
  wxIPC_DIF =              5,
  wxIPC_TIFF =             6,
  wxIPC_OEMTEXT =          7,  /* CF_OEMTEXT */
  wxIPC_DIB =              8,  /* CF_DIB */
  wxIPC_PALETTE =          9,
  wxIPC_PENDATA =          10,
  wxIPC_RIFF =             11,
  wxIPC_WAVE =             12,
  wxIPC_UNICODETEXT =      13,
  wxIPC_ENHMETAFILE =      14,
  wxIPC_FILENAME =         15, /* CF_HDROP */
  wxIPC_LOCALE =           16,
  wxIPC_PRIVATE =          20
};
```

See also

wxDDEClient (p. 300), *wxDDEServer* (p. 305), *Interprocess communications overview* (p. 1438)

wxDDEConnection::wxDDEConnection

wxDDEConnection()

wxDDEConnection(**char*** *buffer*, **int** *size*)

Constructs a connection object. If no user-defined connection object is to be derived

from wxDDEConnection, then the constructor should not be called directly, since the default connection object will be provided on requesting (or accepting) a connection. However, if the user defines his or her own derived connection object, the *wxDDEServer::OnAcceptConnection* (p. 306) and/or *wxDDEClient::OnMakeConnection* (p. 301) members should be replaced by functions which construct the new connection object. If the arguments of the wxDDEConnection constructor are void, then a default buffer is associated with the connection. Otherwise, the programmer must provide a a buffer and size of the buffer for the connection object to use in transactions.

wxDDEConnection::Advise

bool Advise(**const wxString&** *item*, **char*** *data*, **int** *size = -1*, **wxIPCFormat** *format = wxCF_TEXT*)

Called by the server application to advise the client of a change in the data associated with the given item. Causes the client connection's *wxDDEConnection::OnAdvise* (p. 303)member to be called. Returns TRUE if successful.

wxDDEConnection::Execute

bool Execute (**char*** *data*, **int** *size = -1*, **wxIPCFormat** *format = wxCF_TEXT*)

Called by the client application to execute a command on the server. Can also be used to transfer arbitrary data to the server (similar to *wxDDEConnection::Poke* (p. 305) in that respect). Causes the server connection's *wxDDEConnection::OnExecute* (p. 304) member to be called. Returns TRUE if successful.

wxDDEConnection::Disconnect

bool Disconnect()

Called by the client or server application to disconnect from the other program; it causes the *wxDDEConnection::OnDisconnect* (p. 304) message to be sent to the corresponding connection object in the other program. The default behaviour of **OnDisconnect** is to delete the connection, but the calling application must explicitly delete its side of the connection having called **Disconnect**. Returns TRUE if successful.

wxDDEConnection::OnAdvise

virtual bool OnAdvise(**const wxString&** *topic*, **const wxString&** *item*, **char*** *data*, **int** *size*, **wxIPCFormat** *format*)

Message sent to the client application when the server notifies it of a change in the data associated with the given item.

wxDDEConnection::OnDisconnect

virtual bool OnDisconnect()

Message sent to the client or server application when the other application notifies it to delete the connection. Default behaviour is to delete the connection object.

wxDDEConnection::OnExecute

virtual bool OnExecute(**const wxString&** *topic*, **char*** *data*, **int** *size*, **wxIPCFormat** *format*)

Message sent to the server application when the client notifies it to execute the given data. Note that there is no item associated with this message.

wxDDEConnection::OnPoke

virtual bool OnPoke(**const wxString&** *topic*, **const wxString&** *item*, **char*** *data*, **int** *size*, **wxIPCFormat** *format*)

Message sent to the server application when the client notifies it to accept the given data.

wxDDEConnection::OnRequest

virtual char* OnRequest(**const wxString&** *topic*, **const wxString&** *item*, **int *** *size*, **wxIPCFormat** *format*)

Message sent to the server application when the client calls *wxDDEConnection::Request* (p. 305). The server should respond by returning a character string from **OnRequest**, or NULL to indicate no data.

wxDDEConnection::OnStartAdvise

virtual bool OnStartAdvise(**const wxString&** *topic*, **const wxString&** *item*)

Message sent to the server application by the client, when the client wishes to start an 'advise loop' for the given topic and item. The server can refuse to participate by returning FALSE.

wxDDEConnection::OnStopAdvise

virtual bool OnStopAdvise(**const wxString&** *topic*, **const wxString&** *item*)

Message sent to the server application by the client, when the client wishes to stop an 'advise loop' for the given topic and item. The server can refuse to stop the advise loop by returning FALSE, although this doesn't have much meaning in practice.

wxDDEConnection::Poke

bool Poke(**const wxString&** *item*, **char*** *data*, **int** *size = -1*, **wxIPCFormat** *format = wxCF_TEXT*)

Called by the client application to poke data into the server. Can be used to transfer arbitrary data to the server. Causes the server connection's *wxDDEConnection::OnPoke* (p. 304) member to be called. Returns TRUE if successful.

wxDDEConnection::Request

char* Request(**const wxString&** *item*, **int ****size*, **wxIPCFormat** *format = wxIPC_TEXT*)

Called by the client application to request data from the server. Causes the server connection's *wxDDEConnection::OnRequest* (p. 304) member to be called. Returns a character string (actually a pointer to the connection's buffer) if successful, NULL otherwise.

wxDDEConnection::StartAdvise

bool StartAdvise(**const wxString&** *item*)

Called by the client application to ask if an advise loop can be started with the server. Causes the server connection's *wxDDEConnection::OnStartAdvise* (p. 304) member to be called. Returns TRUE if the server okays it, FALSE otherwise.

wxDDEConnection::StopAdvise

bool StopAdvise(**const wxString&** *item*)

Called by the client application to ask if an advise loop can be stopped. Causes the server connection's *wxDDEConnection::OnStopAdvise* (p. 304) member to be called. Returns TRUE if the server okays it, FALSE otherwise.

wxDDEServer

A wxDDEServer object represents the server part of a client-server DDE (Dynamic Data Exchange) conversation.

This DDE-based implementation is available on Windows only, but a platform-independent, socket-based version of this API is available using *wxTCPServer* (p. 1072).

Derived from

wxServerBase

Include files

<wx/dde.h>

See also

wxDDEClient (p. 300), *wxDDEConnection* (p. 301), *IPC overview* (p. 1438)

wxDDEServer::wxDDEServer

wxDDEServer()

Constructs a server object.

wxDDEServer::Create

bool Create(**const wxString&** *service*)

Registers the server using the given service name. Under UNIX, the string must contain an integer id which is used as an Internet port number. FALSE is returned if the call failed (for example, the port number is already in use).

wxDDEServer::OnAcceptConnection

virtual wxConnectionBase * OnAcceptConnection(**const wxString&** *topic*)

When a client calls **MakeConnection**, the server receives the message and this member is called. The application should derive a member to intercept this message and return a connection object of either the standard wxDDEConnection type, or of a user-derived type. If the topic is "STDIO", the application may wish to refuse the connection. Under UNIX, when a server is created the OnAcceptConnection message is always sent for standard input and output, but in the context of DDE messages it doesn't make a lot of sense.

wxDebugContext

A class for performing various debugging and memory tracing operations. Full functionality (such as printing out objects currently allocated) is only present in a debugging build of wxWindows, i.e. if the __WXDEBUG__ symbol is defined. wxDebugContext and related functions and macros can be compiled out by setting wxUSE_DEBUG_CONTEXT to 0 is setup.h

Derived from

No parent class.

Include files

<wx/memory.h>

See also

Overview (p. 1365)

wxDebugContext::Check

int Check()

Checks the memory blocks for errors, starting from the currently set checkpoint.

Return value

Returns the number of errors, so a value of zero represents success. Returns -1 if an error was detected that prevents further checking.

wxDebugContext::Dump

bool Dump()

Performs a memory dump from the currently set checkpoint, writing to the current debug stream. Calls the **Dump** member function for each wxObject derived instance.

Return value

TRUE if the function succeeded, FALSE otherwise.

wxDebugContext::GetCheckPrevious

bool GetCheckPrevious()

Returns TRUE if the memory allocator checks all previous memory blocks for errors. By default, this is FALSE since it slows down execution considerably.

See also

wxDebugContext::SetCheckPrevious (p. 310)

wxDebugContext::GetDebugMode

bool GetDebugMode()

Returns TRUE if debug mode is on. If debug mode is on, the wxObject new and delete operators store or use information about memory allocation. Otherwise, a straight malloc and free will be performed by these operators.

See also

wxDebugContext::SetDebugMode (p. 310)

wxDebugContext::GetLevel

int GetLevel()

Gets the debug level (default 1). The debug level is used by the wxTraceLevel function and the WXTRACELEVEL macro to specify how detailed the trace information is; setting a different level will only have an effect if trace statements in the application specify a value other than one.

This is obsolete, replaced by *wxLog* (p. 655) functionality.

See also

wxDebugContext::SetLevel (p. 311)

wxDebugContext::GetStream

ostream& GetStream()

Returns the output stream associated with the debug context.

This is obsolete, replaced by *wxLog* (p. 655) functionality.

See also

wxDebugContext::SetStream (p. 311)

wxDebugContext::GetStreamBuf

streambuf* GetStreamBuf()

Returns a pointer to the output stream buffer associated with the debug context. There may not necessarily be a stream buffer if the stream has been set by the user.

This is obsolete, replaced by *wxLog* (p. 655) functionality.

wxDebugContext::HasStream

bool HasStream()

Returns TRUE if there is a stream currently associated with the debug context.

This is obsolete, replaced by *wxLog* (p. 655) functionality.

See also

wxDebugContext::SetStream (p. 311), *wxDebugContext::GetStream* (p. 308)

wxDebugContext::PrintClasses

bool PrintClasses()

Prints a list of the classes declared in this application, giving derivation and whether instances of this class can be dynamically created.

See also

wxDebugContext::PrintStatistics (p. 309)

wxDebugContext::PrintStatistics

bool PrintStatistics(**bool** *detailed = TRUE*)

Performs a statistics analysis from the currently set checkpoint, writing to the current debug stream. The number of object and non-object allocations is printed, together with the total size.

Parameters

detailed
    If TRUE, the function will also print how many objects of each class have been allocated, and the space taken by these class instances.

See also

wxDebugContext::PrintStatistics (p. 309)

wxDebugContext::SetCheckpoint

void SetCheckpoint(**bool** *all = FALSE*)

Sets the current checkpoint: Dump and PrintStatistics operations will be performed from this point on. This allows you to ignore allocations that have been performed up to this point.

Parameters

all

    If TRUE, the checkpoint is reset to include all memory allocations since the program started.

wxDebugContext::SetCheckPrevious

void SetCheckPrevious(**bool** *check*)

Tells the memory allocator to check all previous memory blocks for errors. By default, this is FALSE since it slows down execution considerably.

See also

wxDebugContext::GetCheckPrevious (p. 307)

wxDebugContext::SetDebugMode

void SetDebugMode(**bool** *debug*)

Sets the debug mode on or off. If debug mode is on, the wxObject new and delete operators store or use information about memory allocation. Otherwise, a straight malloc and free will be performed by these operators.

By default, debug mode is on if __WXDEBUG__ is defined. If the application uses this function, it should make sure that all object memory allocated is deallocated with the same value of debug mode. Otherwise, the delete operator might try to look for memory information that does not exist.

See also

wxDebugContext::GetDebugMode (p. 308)

wxDebugContext::SetFile

bool SetFile(**const wxString&** *filename*)

Sets the current debug file and creates a stream. This will delete any existing stream and stream buffer. By default, the debug context stream outputs to the debugger (Windows) or standard error (other platforms).

wxDebugContext::SetLevel

void SetLevel(**int** *level*)

Sets the debug level (default 1). The debug level is used by the wxTraceLevel function and the WXTRACELEVEL macro to specify how detailed the trace information is; setting a different level will only have an effect if trace statements in the application specify a value other than one.

This is obsolete, replaced by *wxLog* (p. 655) functionality.

See also

wxDebugContext::GetLevel (p. 308)

wxDebugContext::SetStandardError

bool SetStandardError()

Sets the debugging stream to be the debugger (Windows) or standard error (other platforms). This is the default setting. The existing stream will be flushed and deleted.

This is obsolete, replaced by *wxLog* (p. 655) functionality.

wxDebugContext::SetStream

void SetStream(**ostream*** *stream*, **streambuf*** *streamBuf = NULL*)

Sets the stream and optionally, stream buffer associated with the debug context. This operation flushes and deletes the existing stream (and stream buffer if any).

This is obsolete, replaced by *wxLog* (p. 655) functionality.

Parameters

stream
    Stream to associate with the debug context. Do not set this to NULL.

streamBuf
    Stream buffer to associate with the debug context.

See also

wxDebugContext::GetStream (p. 308), *wxDebugContext::HasStream* (p. 309)

wxDebugStreamBuf

This class allows you to treat debugging output in a similar (stream-based) fashion on different platforms. Under Windows, an ostream constructed with this buffer outputs to the debugger, or other program that intercepts debugging output. On other platforms, the output goes to standard error (cerr).

This is soon to be obsolete, replaced by *wxLog* (p. 655) functionality.

Derived from

streambuf

Include files

<wx/memory.h>

Example

```
wxDebugStreamBuf streamBuf;
ostream stream(&streamBuf);

stream << "Hello world!" << endl;
```

See also

Overview (p. 1365)

wxDialog

A dialog box is a window with a title bar and sometimes a system menu, which can be moved around the screen. It can contain controls and other windows.

Derived from

wxPanel (p. 769)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/dialog.h>

Remarks

There are two kinds of dialog - *modal* and *modeless.* A modal dialog blocks program flow and user input on other windows until it is dismissed, whereas a modeless dialog behaves more like a frame in that program flow continues, and input on other windows is still possible. You specify the type of dialog with the **wxDIALOG_MODAL** and **wxDIALOG_MODELESS** window styles.

A dialog may be loaded from a wxWindows resource file (extension wxr), which may itself be created by Dialog Editor. For details, see *The wxWindows resource system* (p. 1388), *wxWindows resource functions* (p. 1300) and the resource sample.

An application can define an *OnCloseWindow* (p. 1213) handler for the dialog to respond to system close events.

Window styles

wxDIALOG_MODAL	Specifies that the dialog box will be modal.
wxCAPTION	Puts a caption on the dialog box.
wxDEFAULT_DIALOG_STYLE	Equivalent to a combination of wxCAPTION, wxSYSTEM_MENU and wxTHICK_FRAME
wxRESIZE_BORDER	Display a resizeable frame around the window.
wxSYSTEM_MENU	Display a system menu.
wxTHICK_FRAME	Display a thick frame around the window.
wxSTAY_ON_TOP	The dialog stays on top of all other windows (Windows only).
wxNO_3D	Under Windows, specifies that the child controls should not have 3D borders unless specified in the control.

Under Unix or Linux, MWM (the Motif Window Manager) or other window managers reckognizing the MHM hints should be running for any of these styles to have an effect.

See also *Generic window styles* (p. 1379).

See also

wxDialog overview (p. 1381), *wxFrame* (p. 454), *Resources* (p. 9), *Validator overview* (p. 1382)

wxDialog::wxDialog

wxDialog()

Default constructor.

 wxDialog(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_DIALOG_STYLE*, **const wxString&** *name* = *"dialogBox"*)

Constructor.

Parameters

parent
　　Can be NULL, a frame or another dialog box.

id
　　An identifier for the dialog. A value of -1 is taken to mean a default.

title
　　The title of the dialog.

pos
　　The dialog position. A value of (-1, -1) indicates a default position, chosen by either the windowing system or wxWindows, depending on platform.

size
　　The dialog size. A value of (-1, -1) indicates a default size, chosen by either the windowing system or wxWindows, depending on platform.

style
　　The window style. See *wxDialog* (p. 312).

name
　　Used to associate a name with the window, allowing the application user to set Motif resource values for individual dialog boxes.

See also

wxDialog::Create (p. 315)

wxDialog::~wxDialog

 ~wxDialog()

Destructor. Deletes any child windows before deleting the physical window.

wxDialog::Centre

void Centre(**int** *direction* = *wxBOTH*)

Centres the dialog box on the display.

Parameters

direction
    May be wxHORIZONTAL, wxVERTICAL or wxBOTH.

wxDialog::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_DIALOG_STYLE*, **const wxString&** *name* = *"dialogBox"*)

Used for two-step dialog box construction. See *wxDialog::wxDialog* (p. 313) for details.

wxDialog::EndModal

void EndModal(**int** *retCode*)

Ends a modal dialog, passing a value to be returned from the *wxDialog::ShowModal* (p. 320) invocation.

Parameters

retCode
    The value that should be returned by **ShowModal**.

See also

wxDialog::ShowModal (p. 320), *wxDialog::GetReturnCode* (p. 315), *wxDialog::SetReturnCode* (p. 319)

wxDialog::GetReturnCode

int GetReturnCode()

Gets the return code for this window.

Remarks

A return code is normally associated with a modal dialog, where *wxDialog::ShowModal* (p. 320) returns a code to the application.

See also

wxDialog::SetReturnCode (p. 319), *wxDialog::ShowModal* (p. 320), *wxDialog::EndModal* (p. 315)

wxDialog::GetTitle

wxString GetTitle() const

Returns the title of the dialog box.

wxDialog::Iconize

void Iconize(const bool *iconize*)

Iconizes or restores the dialog. Windows only.

Parameters

iconize
　　If TRUE, iconizes the dialog box; if FALSE, shows and restores it.

Remarks

Note that in Windows, iconization has no effect since dialog boxes cannot be iconized. However, applications may need to explicitly restore dialog boxes under Motif which have user-iconizable frames, and under Windows calling `Iconize(FALSE)` will bring the window to the front, as does `Show(TRUE)`.

wxDialog::IsIconized

bool IsIconized() const

Returns TRUE if the dialog box is iconized. Windows only.

Remarks

Always returns FALSE under Windows since dialogs cannot be iconized.

wxDialog::IsModal

bool IsModal() const

Returns TRUE if the dialog box is modal, FALSE otherwise.

wxDialog::OnCharHook

void OnCharHook(**wxKeyEvent&** *event*)

This member is called to allow the window to intercept keyboard events before they are processed by child windows.

For more information, see *wxWindow::OnCharHook* (p. 1212)

Remarks

wxDialog implements this handler to fake a cancel command if the escape key has been pressed. This will dismiss the dialog.

wxDialog::OnApply

void OnApply(**wxCommandEvent&** *event*)

The default handler for the wxID_APPLY identifier.

Remarks

This function calls *wxWindow::Validate* (p. 1239) and *wxWindow::TransferDataToWindow* (p. 1238).

See also

wxDialog::OnOK (p. 317), *wxDialog::OnCancel* (p. 317)

wxDialog::OnCancel

void OnCancel(**wxCommandEvent&** *event*)

The default handler for the wxID_CANCEL identifier.

Remarks

The function either calls **EndModal(wxID_CANCEL)** if the dialog is modal, or sets the return value to wxID_CANCEL and calls **Show(FALSE)** if the dialog is modeless.

See also

wxDialog::OnOK (p. 317), *wxDialog::OnApply* (p. 317)

wxDialog::OnOK

void OnOK(**wxCommandEvent&** *event*)

The default handler for the wxID_OK identifier.

Remarks

The function calls *wxWindow::Validate* (p. 1239), then
wxWindow::TransferDataFromWindow (p. 1238). If this returns TRUE, the function either
calls **EndModal(wxID_OK)** if the dialog is modal, or sets the return value to wxID_OK
and calls **Show(FALSE)** if the dialog is modeless.

See also

wxDialog::OnCancel (p. 317), *wxDialog::OnApply* (p. 317)

wxDialog::OnSysColourChanged

void OnSysColourChanged(**wxSysColourChangedEvent&** *event*)

The default handler for wxEVT_SYS_COLOUR_CHANGED.

Parameters

event
    The colour change event.

Remarks

Changes the dialog's colour to conform to the current settings (Windows only). Add an
event table entry for your dialog class if you wish the behaviour to be different (such as
keeping a user-defined background colour). If you do override this function, call
wxWindow::OnSysColourChanged (p. 1222) to propagate the notification to child
windows and controls.

See also

wxSysColourChangedEvent (p. 1039)

wxDialog::SetModal

void SetModal(**const bool** *flag*)

NB: This function is deprecated and doesn't work for all ports, just use *ShowModal* (p.
320) to show a modal dialog instead.

Allows the programmer to specify whether the dialog box is modal (wxDialog::Show
blocks control until the dialog is hidden) or modeless (control returns immediately).

Parameters

flag

If TRUE, the dialog will be modal, otherwise it will be modeless.

wxDialog::SetReturnCode

void SetReturnCode(**int** *retCode*)

Sets the return code for this window.

Parameters

retCode
　　The integer return code, usually a control identifier.

Remarks

A return code is normally associated with a modal dialog, where *wxDialog::ShowModal* (p. 320) returns a code to the application. The function *wxDialog::EndModal* (p. 315) calls **SetReturnCode**.

See also

wxDialog::GetReturnCode (p. 315), *wxDialog::ShowModal* (p. 320), *wxDialog::EndModal* (p. 315)

wxDialog::SetTitle

void SetTitle(**const wxString&** *title*)

Sets the title of the dialog box.

Parameters

title
　　The dialog box title.

wxDialog::Show

bool Show(**const bool** *show*)

Hides or shows the dialog.

Parameters

show
　　If TRUE, the dialog box is shown and brought to the front; otherwise the box is hidden. If FALSE and the dialog is modal, control is returned to the calling program.

Remarks

The preferred way of dismissing a modal dialog is to use *wxDialog::EndModal* (p. 315).

wxDialog::ShowModal

int ShowModal()

Shows a modal dialog. Program flow does not return until the dialog has been dismissed with *wxDialog::EndModal* (p. 315).

Return value

The return value is the value set with *wxDialog::SetReturnCode* (p. 319).

See also

wxDialog::EndModal (p. 315), *wxDialog:GetReturnCode* (p. 315), *wxDialog::SetReturnCode* (p. 319)

wxDialUpEvent

This is the event class for the dialup events sent by *wxDialUpManager* (p. 321).

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/dialup.h>

wxDialUpEvent::wxDialUpEvent

wxDialUpEvent(**bool** *isConnected*, **bool** *isOwnEvent*)

Constructor is only used by *wxDialUpManager* (p. 321).

wxDialUpEvent::IsConnectedEvent

bool IsConnectedEvent() const

Is this a `CONNECTED` or `DISCONNECTED` event? In other words, does it notify about transition from offline to online state or vice versa?

wxDialUpEvent::IsOwnEvent

bool IsOwnEvent() const

Does this event come from wxDialUpManager::Dial() or from some extrenal process (i.e. does it result from our own attempt to establish the connection)?

wxDialUpManager

This class encapsulates functions dealing with veryfying the connection status of the workstation (connected to the Internet via a direct connection, connected through a modem or not connected at all) and to establish this connection if possible/required (i.e. in the case of the modem).

The program may also wish to be notified about the change in the connection status (for example, to perform some action when the user connects to the network the next time or, on the contrary, to stop receiving data from the net when the user hangs up the modem). For this, you need to use one of the event macros described below.

This class is different from other wxWindows classes in that there is at most one instance of this class in the program accessed via *wxDialUpManager::Create()* (p. 322) and you can't create the objects of this class directly.

Derived from

No base class

Include files

<wx/dialup.h>

Event table macros

To be notified about the change in the network connection status, use these event handler macros to direct input to member functions that take a *wxDialUpEvent* (p. 320) argument.

EVT_DIALUP_CONNECTED(func)   A connection with the network was established.
EVT_DIALUP_DISCONNECTED(func) The connection with the network was lost.

dialup sample (p. 1329)
wxDialUpEvent (p. 320)

wxDialUpManager::Create

wxDialUpManager* Create()

This function should create and return the object of the platform-specific class derived from wxDialUpManager. You should delete the pointer when you are done with it.

wxDialUpManager::IsOk

bool IsOk() const

Returns TRUE if the dialup manager was initialized correctly. If this function returns FALSE, no other functions will work neither, so it is a good idea to call this function and check its result before calling any other wxDialUpManager methods

wxDialUpManager::~wxDialUpManager

~wxDialUpManager()

Destructor.

wxDialUpManager::GetISPNames

size_t GetISPNames(wxArrayString& *names*) const

This function is only implemented under Windows.

Fills the array with the names of all possible values for the first parameter to *Dial()* (p. 322) on this machine and returns their number (may be 0).

wxDialUpManager::Dial

bool Dial(const wxString& *nameOfISP* = *wxEmptyString*, const wxString& *username* = *wxEmptyString*, const wxString& *password* = *wxEmptyString*, bool *async* = *TRUE*)

Dial the given ISP, use *username* and *password* to authentificate.

The parameters are only used under Windows currently, for Unix you should use

SetConnectCommand (p. 325) to customize this functions behaviour.

If no *nameOfISP* is given, the function will select the default one (proposing the user to choose among all connections defined on this machine) and if no username and/or password are given, the function will try to do without them, but will ask the user if really needed.

If *async* parameter is FALSE, the function waits until the end of dialing and returns TRUE upon successful completion.

If *async* is TRUE, the function only initiates the connection and returns immediately - the result is reported via events (an event is sent anyhow, but if dialing failed it will be a DISCONNECTED one).

wxDialUpManager::IsDialing

bool IsDialing() const

Returns TRUE if (async) dialing is in progress.

See also

Dial (p. 322)

wxDialUpManager::CancelDialing

bool CancelDialing()

Cancel dialing the number initiated with *Dial* (p. 322) with async parameter equal to TRUE.

Note that this won't result in DISCONNECTED event being sent.

See also

IsDialing (p. 323)

wxDialUpManager::HangUp

bool HangUp()

Hang up the currently active dial up connection.

wxDialUpManager::IsAlwaysOnline

bool IsAlwaysOnline() const

Returns TRUE if the computer has a permanent network connection (i.e. is on a LAN) and so there is no need to use Dial() function to go online.

NB: this functions tries to guess the result and it is not always guaranteed to be correct, so it is better to ask user for confirmation or give him a possibility to override it.

wxDialUpManager::IsOnline

bool IsOnline() **const**

Returns TRUE if the computer is connected to the network: under Windows, this just means that a RAS connection exists, under Unix we check that the "well-known host" (as specified by *SetWellKnownHost* (p. 325)) is reachable.

wxDialUpManager::SetOnlineStatus

void SetOnlineStatus(**bool** *isOnline = TRUE*)

Sometimes the built-in logic for determining the online status may fail, so, in general, the user should be allowed to override it. This function allows to forcefully set the online status - whatever our internal algorithm may think about it.

See also

IsOnline (p. 324)

wxDialUpManager::EnableAutoCheckOnlineStatus

bool EnableAutoCheckOnlineStatus(**size_t** *nSeconds = 60*)

Enable automatical checks for the connection status and sending of wxEVT_DIALUP_CONNECTED/wxEVT_DIALUP_DISCONNECTED events. The interval parameter is only for Unix where we do the check manually and specifies how often should we repeat the check (each minute by default). Under Windows, the notification about the change of connection status is sent by the system and so we don't do any polling and this parameter is ignored.

Returns FALSE if couldn't set up automatic check for online status.

wxDialUpManager::DisableAutoCheckOnlineStatus

void DisableAutoCheckOnlineStatus()

Disable automatic check for connection status change - notice that thewxEVT_DIALUP_XXX events won't be sent any more neither.

wxDialUpManager::SetWellKnownHost

void SetWellKnownHost(**const wxString&** *hostname*, **int** *portno = 80*)

This method is for Unix only.

Under Unix, the value of well-known host is used to check whether we're connected to the internet. It is unused under Windows, but this function is always safe to call. The default value is `www.yahoo.com:80`.

wxDialUpManager::SetConnectCommand

 SetConnectCommand(**const wxString&** *commandDial = wxT("/usr/bin/pon")*, **const wxString&** *commandHangup = wxT("/usr/bin/poff")*)

This method is for Unix only.

Sets the commands to start up the network and to hang up again.

See also

Dial (p. 322)

wxDir

wxDir is a portable equivalent of Unix open/read/closedir functions which allow enumerating of the files in a directory. wxDir allows enumerate files as well as directories.

Example of use:

```
    wxDir dir(wxGetCwd());

    if ( !dir.IsOpened() )
    {
        // deal with the error here - wxDir would already log an error
message
        // explaining the exact reason of the failure
        return;
    }

    puts("Enumerating object files in current directory:");

    wxString filename;
```

```
    bool cont = dir.GetFirst(&filename, filespec, flags);
    while ( cont )
    {
        printf("%s\n", filename.c_str());

        cont = dir.GetNext(&filename);
    }
```

Derived from

No base class

Constants

These flags define what kind of filenames is included in the list of files enumerated by GetFirst/GetNext

```
enum
{
    wxDIR_FILES     = 0x0001,       // include files
    wxDIR_DIRS      = 0x0002,       // include directories
    wxDIR_HIDDEN    = 0x0004,       // include hidden files
    wxDIR_DOTDOT    = 0x0008,       // include '.' and '..'

    // by default, enumerate everything except '.' and '..'
    wxDIR_DEFAULT   = wxDIR_FILES | wxDIR_DIRS | wxDIR_HIDDEN
}
```

Include files

<wx/dir.h>

wxDir::Exists

static bool Exists(**const wxString&** *dir*)

Test for existence of a directory with the given name

wxDir::wxDir

wxDir()

Default constructor, use *Open()* (p. 327) afterwards.

wxDir(**const wxString&** *dir*)

Opens the directory for enumeration, use *IsOpened()* (p. 327) to test for errors.

wxDir::~wxDir

~wxDir()

Destructor cleans up the associated ressources. It is not virtual and so this class is not meant to be used polymorphically.

wxDir::Open

bool Open(**const wxString&** *dir*)

Open the directory for enumerating, returns TRUE on success or FALSE if an error occurred.

wxDir::IsOpened

bool IsOpened() **const**

Returns TRUE if the directory was successfully opened by a previous call to *Open* (p. 327).

wxDir::GetFirst

bool GetFirst(**wxString*** *filename*, **const wxString&** *filespec* = *wxEmptyString*, **int** *flags* = *wxDIR_DEFAULT*) **const**

Start enumerating all files matching *filespec* (or all files if it is empty) and flags, return TRUE on success.

wxDir::GetNext

bool GetNext(**wxString*** *filename*) **const**

Continue enumerating files satisfying the criteria specified by the last call to *GetFirst* (p. 327).

wxDirDialog

This class represents the directory chooser dialog.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/dirdlg.h>

See also

wxDirDialog overview (p. 1410), *wxFileDialog* (p. 410)

wxDirDialog::wxDirDialog

 wxDirDialog(**wxWindow*** *parent*, **const wxString&** *message = "Choose a directory"*, **const wxString&** *defaultPath = ""*, **long** *style = 0*, **const wxPoint&** *pos = wxDefaultPosition*)

Constructor. Use *wxDirDialog::ShowModal* (p. 329) to show the dialog.

Parameters

parent
Parent window.

message
Message to show on the dialog.

defaultPath
The default path, or the empty string.

style
A dialog style, currently unused.

pos
Dialog position. Not implemented.

wxDirDialog::~wxDirDialog

 ~wxDirDialog()

Destructor.

wxDirDialog::GetPath

wxString GetPath() **const**

Returns the default or user-selected path.

wxDirDialog::GetMessage

wxString GetMessage() **const**

Returns the message that will be displayed on the dialog.

wxDirDialog::GetStyle

long GetStyle() **const**

Returns the dialog style.

wxDirDialog::SetMessage

void SetMessage(**const wxString&** *message*)

Sets the message that will be displayed on the dialog.

wxDirDialog::SetPath

void SetPath(**const wxString&** *path*)

Sets the default path.

wxDirDialog::SetStyle

void SetStyle(**long** *style*)

Sets the dialog style. This is currently unused.

wxDirDialog::ShowModal

int ShowModal()

Shows the dialog, returning wxID_OK if the user pressed OK, and wxOK_CANCEL otherwise.

wxDllLoader

wxDllLoader is a class providing an interface similar to Unix's dlopen(). It is used by the wxLibrary framework and manages the actual loading of shared libraries and the resolving of symbols in them. There are no instances of this class, it simply serves as a namespace for its static member functions.

The terms *DLL* and *shared library/object* will both be used in the documentation to refer to the same thing: a .dll file under Windows or .so or .sl one under Unix.

Example of using this class to dynamically load strlen() function:

```
#if defined(__WXMSW__)
    static const wxChar *LIB_NAME = _T("kernel32");
    static const wxChar *FUNC_NAME = _T("lstrlenA");
#elif defined(__UNIX__)
    static const wxChar *LIB_NAME = _T("/lib/libc-2.0.7.so");
    static const wxChar *FUNC_NAME = _T("strlen");
#endif

    wxDllType dllHandle = wxDllLoader::LoadLibrary(LIB_NAME);
    if ( !dllHandle )
    {
        ... error ...
    }
    else
    {
        typedef int (*strlenType)(char *);
        strlenType pfnStrlen =
(strlenType)wxDllLoader::GetSymbol(dllHandle, FUNC_NAME);
        if ( !pfnStrlen )
        {
            ... error ...
        }
        else
        {
            if ( pfnStrlen("foo") != 3 )
            {
                ... error ...
            }
            else
            {
                ... ok! ...
            }
        }

        wxDllLoader::UnloadLibrary(dllHandle);
    }
```

Derived from

No base class

Include files

<wx/dynlib.h>

Data structures

This header defines a platfrom-dependent `wxDllType` typedef which stores a handle to a loaded DLLs on the given platform.

wxDllLoader::GetDllExt

static wxString GetDllExt()

Returns the string containing the usual extension for shared libraries for the given systems (including the leading dot if not empty).

For example, this function will return `".dll"` under Windows or (usually) `".so"` under Unix.

wxDllLoader::GetProgramHandle

wxDllType GetProgramHandle()

This function returns a valid handle for the main program itself. Notice that the `NULL` return value is valid for some systems (i.e. doesn't mean that the function failed).

NB: This function is Unix specific. It will always fail under Windows or OS/2.

wxDllLoader::GetSymbol

void * GetSymbol(**wxDllType** *dllHandle*, **const wxString&** *name*)

This function resolves a symbol in a loaded DLL, such as a variable or function name.

Returned value will be `NULL` if the symbol was not found in the DLL or if an error occured.

Parameters

dllHandle

Valid handle previously returned by *LoadLibrary* (p. 332)

name
Name of the symbol.

wxDllLoader::LoadLibrary

wxDllType LoadLibrary(**const wxString &** *libname*, **bool*** *success = NULL*)

This function loads a shared library into memory, with *libname* being the name of the library: it may be either the full name including path and (platform-dependent) extenesion, just the basename (no path and no extension) or a basename with extentsion. In the last two cases, the library will be searched in all standard locations.

Returns a handle to the loaded DLL. Use *success* parameter to test if it is valid. If the handle is valid, the library must be unloaded later with *UnloadLibrary* (p. 332).

Parameters

libname
Name of the shared object to load.

success
May point to a bool variable which will be set to TRUE or FALSE; may also be NULL.

wxDllLoader::UnloadLibrary

void UnloadLibrary(**wxDllType** *dllhandle*)

This function unloads the shared library. The handle *dllhandle* must have been returned by *LoadLibrary* (p. 332) previously.

wxDocChildFrame

The wxDocChildFrame class provides a default frame for displaying documents on separate windows. This class can only be used for SDI (not MDI) child frames.

The class is part of the document/view framework supported by wxWindows, and cooperates with the *wxView* (p. 1184), *wxDocument* (p. 353), *wxDocManager* (p. 334) and *wxDocTemplate* (p. 348) classes.

See the example application in samples/docview.

Derived from

wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/docview.h>

See also

Document/view overview (p. 1411), *wxFrame* (p. 454)

wxDocChildFrame::m_childDocument

wxDocument* m_childDocument

The document associated with the frame.

wxDocChildFrame::m_childView

wxView* m_childView

The view associated with the frame.

wxDocChildFrame::wxDocChildFrame

wxDocChildFrame (**wxDocument*** *doc*, **wxView*** *view*, **wxFrame*** *parent*,
wxWindowID *id*, **const wxString&** *title*, **const wxPoint&** *pos = wxDefaultPosition*,
const wxSize& *size = wxDefaultSize*, **long** *style = wxDEFAULT_FRAME_STYLE*,
const wxString& *name = "frame"*)

Constructor.

wxDocChildFrame::~wxDocChildFrame

~wxDocChildFrame ()

Destructor.

wxDocChildFrame::GetDocument

wxDocument* GetDocument() **const**

Returns the document associated with this frame.

wxDocChildFrame::GetView

wxView* GetView() **const**

Returns the view associated with this frame.

wxDocChildFrame::OnActivate

void OnActivate(**wxActivateEvent** *event*)

Sets the currently active view to be the frame's view. You may need to override (but still call) this function in order to set the keyboard focus for your subwindow.

wxDocChildFrame::OnCloseWindow

void OnCloseWindow(**wxCloseEvent&** *event*)

Closes and deletes the current view and document.

wxDocChildFrame::SetDocument

void SetDocument(**wxDocument ****doc*)

Sets the document for this frame.

wxDocChildFrame::SetView

void SetView(**wxView ****view*)

Sets the view for this frame.

wxDocManager

The wxDocManager class is part of the document/view framework supported by wxWindows, and cooperates with the *wxView* (p. 1184), *wxDocument* (p. 353) and *wxDocTemplate* (p. 348) classes.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/docview.h>

See also

wxDocManager overview (p. 1414), *wxDocument* (p. 353), *wxView* (p. 1184),
wxDocTemplate (p. 348), *wxFileHistory* (p. 415)

wxDocManager::m_currentView

wxView* m_currentView

The currently active view.

wxDocManager::m_defaultDocumentNameCounter

int m_defaultDocumentNameCounter

Stores the integer to be used for the next default document name.

wxDocManager::m_fileHistory

wxFileHistory* m_fileHistory

A pointer to an instance of *wxFileHistory* (p. 415), which manages the history of recently-visited files on the File menu.

wxDocManager::m_maxDocsOpen

int m_maxDocsOpen

Stores the maximum number of documents that can be opened before existing documents are closed. By default, this is 10,000.

wxDocManager::m_docs

wxList m_docs

A list of all documents.

wxDocManager::m_flags

long m_flags

Stores the flags passed to the constructor.

wxDocManager::m_lastDirectory

The directory last selected by the user when opening a file.

wxFileHistory* m_fileHistory

wxDocManager::m_templates

wxList mnTemplates

A list of all document templates.

wxDocManager::wxDocManager

void wxDocManager(**long** *flags* = *wxDEFAULT_DOCMAN_FLAGS*, **bool** *initialize* = *TRUE*)

Constructor. Create a document manager instance dynamically near the start of your application before doing any document or view operations.

flags is currently unused.

If *initialize* is TRUE, the *Initialize* (p. 340) function will be called to create a default history list object. If you derive from wxDocManager, you may wish to call the base constructor with FALSE, and then call Initialize in your own constructor, to allow your own Initialize or OnCreateFileHistory functions to be called.

wxDocManager::~wxDocManager

void ~wxDocManager()

Destructor.

wxDocManager::ActivateView

void ActivateView(**wxView*** *doc*, **bool** *activate*, **bool** *deleting*)

Sets the current view.

wxDocManager::AddDocument

void AddDocument(**wxDocument** *doc)

Adds the document to the list of documents.

wxDocManager::AddFileToHistory

void AddFileToHistory(**const wxString&** *filename*)

Adds a file to the file history list, if we have a pointer to an appropriate file menu.

wxDocManager::AssociateTemplate

void AssociateTemplate(**wxDocTemplate** *temp)

Adds the template to the document manager's template list.

wxDocManager::CreateDocument

wxDocument* CreateDocument(**const wxString&** *path*, **long** *flags*)

Creates a new document in a manner determined by the *flags* parameter, which can be:

- wxDOC_NEW Creates a fresh document.
- wxDOC_SILENT Silently loads the given document file.

If wxDOC_NEW is present, a new document will be created and returned, possibly after asking the user for a template to use if there is more than one document template. If wxDOC_SILENT is present, a new document will be created and the given file loaded into it. If neither of these flags is present, the user will be presented with a file selector for the file to load, and the template to use will be determined by the extension (Windows) or by popping up a template choice list (other platforms).

If the maximum number of documents has been reached, this function will delete the oldest currently loaded document before creating a new one.

wxDocManager::CreateView

wxView* CreateView(**wxDocument***doc*, **long** *flags*)

Creates a new view for the given document. If more than one view is allowed for the

document (by virtue of multiple templates mentioning the same document type), a choice of view is presented to the user.

wxDocManager::DisassociateTemplate

void DisassociateTemplate(**wxDocTemplate** **temp*)

Removes the template from the list of templates.

wxDocManager::FileHistoryAddFilesToMenu

void FileHistoryAddFilesToMenu()

Appends the files in the history list, to all menus managed by the file history object.

void FileHistoryAddFilesToMenu(**wxMenu*** *menu*)

Appends the files in the history list, to the given menu only.

wxDocManager::FileHistoryLoad

void FileHistoryLoad(**wxConfigBase&** *config*)

Loads the file history from a config object.

See also

wxConfig (p. 162)

wxDocManager::FileHistoryRemoveMenu

void FileHistoryRemoveMenu(**wxMenu*** *menu*)

Removes the given menu from the list of menus managed by the file history object.

wxDocManager::FileHistorySave

void FileHistorySave(**wxConfigBase&** *resourceFile*)

Saves the file history into a config object. This must be called explicitly by the application.

See also

wxConfig (p. 162)

wxDocManager::FileHistoryUseMenu

void FileHistoryUseMenu(wxMenu* *menu*)

Use this menu for appending recently-visited document filenames, for convenient access. Calling this function with a valid menu pointer enables the history list functionality.

Note that you can add multiple menus using this function, to be managed by the file history object.

wxDocManager::FindTemplateForPath

wxDocTemplate * FindTemplateForPath(const wxString& *path*)

Given a path, try to find template that matches the extension. This is only an approximate method of finding a template for creating a document.

wxDocManager::GetCurrentDocument

wxDocument * GetCurrentDocument()

Returns the document associated with the currently active view (if any).

wxDocManager::GetCurrentView

wxView * GetCurrentView()

Returns the currently active view

wxDocManager::GetDocuments

wxList& GetDocuments()

Returns a reference to the list of documents.

wxDocManager::GetFileHistory

wxFileHistory * GetFileHistory()

Returns a pointer to file history.

wxDocManager::GetLastDirectory

wxString GetLastDirectory() const

Returns the directory last selected by the user when opening a file. Initially empty.

wxDocManager::GetMaxDocsOpen

int GetMaxDocsOpen()

Returns the number of documents that can be open simultaneously.

wxDocManager::GetNoHistoryFiles

int GetNoHistoryFiles()

Returns the number of files currently stored in the file history.

wxDocManager::Initialize

bool Initialize()

Initializes data; currently just calls OnCreateFileHistory. Some data cannot always be initialized in the constructor because the programmer must be given the opportunity to override functionality. If OnCreateFileHistory was called from the constructor, an overridden virtual OnCreateFileHistory would not be called due to C++'s 'interesting' constructor semantics. In fact Initialize *is* called from the wxDocManager constructor, but this can be vetoed by passing FALSE to the second argument, allowing the derived class's constructor to call Initialize, possibly calling a different OnCreateFileHistory from the default.

The bottom line: if you're not deriving from Initialize, forget it and construct wxDocManager with no arguments.

wxDocManager::MakeDefaultName

bool MakeDefaultName(const wxString& *buf*)

Copies a suitable default name into *buf*. This is implemented by appending an integer counter to the string **unnamed** and incrementing the counter.

wxDocManager::OnCreateFileHistory

wxFileHistory * **OnCreateFileHistory**()

A hook to allow a derived class to create a different type of file history. Called from *Initialize* (p. 340).

wxDocManager::OnFileClose

void OnFileClose()

Closes and deletes the currently active document.

wxDocManager::OnFileNew

void OnFileNew()

Creates a document from a list of templates (if more than one template).

wxDocManager::OnFileOpen

void OnFileOpen()

Creates a new document and reads in the selected file.

wxDocManager::OnFileSave

void OnFileSave()

Saves the current document by calling wxDocument::Save for the current document.

wxDocManager::OnFileSaveAs

void OnFileSaveAs()

Calls wxDocument::SaveAs for the current document.

wxDocManager::OnMenuCommand

void OnMenuCommand(**int** *cmd*)

Processes menu commands routed from child or parent frames. This deals with the following predefined menu item identifiers:

- wxID_OPEN Creates a new document and opens a file into it.

- wxID_CLOSE Closes the current document.
- wxID_NEW Creates a new document.
- wxID_SAVE Saves the document.
- wxID_SAVE_AS Saves the document into a specified filename.

Unrecognized commands are routed to the currently active wxView's OnMenuCommand.

wxDocManager::RemoveDocument

void RemoveDocument(**wxDocument ****doc*)

Removes the document from the list of documents.

wxDocManager::SelectDocumentPath

wxDocTemplate * SelectDocumentPath(**wxDocTemplate *****templates*, **int** *noTemplates*, **const wxString&** *path*, **const wxString&** *bufSize*, **long** *flags*, **bool** *save*)

Under Windows, pops up a file selector with a list of filters corresponding to document templates. The wxDocTemplate corresponding to the selected file's extension is returned.

On other platforms, if there is more than one document template a choice list is popped up, followed by a file selector.

This function is used in wxDocManager::CreateDocument.

wxDocManager::SelectDocumentType

wxDocTemplate * SelectDocumentType(**wxDocTemplate *****templates*, **int** *noTemplates*)

Returns a document template by asking the user (if there is more than one template). This function is used in wxDocManager::CreateDocument.

wxDocManager::SelectViewType

wxDocTemplate * SelectViewType(**wxDocTemplate *****templates*, **int** *noTemplates*)

Returns a document template by asking the user (if there is more than one template), displaying a list of valid views. This function is used in wxDocManager::CreateView. The dialog normally won't appear because the array of templates only contains those relevant to the document in question, and often there will only be one such.

wxDocManager::SetLastDirectory

void SetLastDirectory(const wxString& *dir*)

Sets the directory to be displayed to the user when opening a file. Initially this is empty.

wxDocManager::SetMaxDocsOpen

void SetMaxDocsOpen(**int** *n*)

Sets the maximum number of documents that can be open at a time. By default, this is 10,000. If you set it to 1, existing documents will be saved and deleted when the user tries to open or create a new one (similar to the behaviour of Windows Write, for example). Allowing multiple documents gives behaviour more akin to MS Word and other Multiple Document Interface applications.

wxDocMDIChildFrame

The wxDocMDIChildFrame class provides a default frame for displaying documents on separate windows. This class can only be used for MDI child frames.

The class is part of the document/view framework supported by wxWindows, and cooperates with the *wxView* (p. 1184), *wxDocument* (p. 353), *wxDocManager* (p. 334) and *wxDocTemplate* (p. 348) classes.

See the example application in `samples/docview`.

Derived from

wxMDIChildFrame (p. 670)
wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/docmdi.h>

See also

Document/view overview (p. 1411), *wxMDIChildFrame* (p. 670)

wxDocMDIChildFrame::m_childDocument

wxDocument* m_childDocument

The document associated with the frame.

wxDocMDIChildFrame::m_childView

wxView* m_childView

The view associated with the frame.

wxDocMDIChildFrame::wxDocMDIChildFrame

wxDocMDIChildFrame(**wxDocument*** *doc*, **wxView*** *view*, **wxFrame*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxDEFAULT_FRAME_STYLE*, **const wxString&** *name = "frame"*)

Constructor.

wxDocMDIChildFrame::~wxDocMDIChildFrame

~wxDocMDIChildFrame()

Destructor.

wxDocMDIChildFrame::GetDocument

wxDocument* GetDocument() **const**

Returns the document associated with this frame.

wxDocMDIChildFrame::GetView

wxView* GetView() **const**

Returns the view associated with this frame.

wxDocMDIChildFrame::OnActivate

void OnActivate(**wxActivateEvent** *event*)

Sets the currently active view to be the frame's view. You may need to override (but still call) this function in order to set the keyboard focus for your subwindow.

wxDocMDIChildFrame::OnCloseWindow

void OnCloseWindow(**wxCloseEvent&** *event*)

Closes and deletes the current view and document.

wxDocMDIChildFrame::SetDocument

void SetDocument(**wxDocument ****doc*)

Sets the document for this frame.

wxDocMDIChildFrame::SetView

void SetView(**wxView ****view*)

Sets the view for this frame.

wxDocMDIParentFrame

The wxDocMDIParentFrame class provides a default top-level frame for applications using the document/view framework. This class can only be used for MDI parent frames.

It cooperates with the *wxView* (p. 1184), *wxDocument* (p. 353), *wxDocManager* (p. 334) and *wxDocTemplates* (p. 348) classes.

See the example application in samples/docview.

Derived from

wxMDIParentFrame (p. 675)
wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/docmdi.h>

See also

Document/view overview (p. 1411), *wxMDIParentFrame* (p. 675)

wxDocMDIParentFrame::wxDocMDIParentFrame

wxDocParentFrame (**wxDocManager*** *manager*, **wxFrame** *parent, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE*, **const wxString&** *name* = *"frame"*)

Constructor.

wxDocMDIParentFrame::~wxDocMDIParentFrame

~wxDocMDIParentFrame ()

Destructor.

wxDocMDIParentFrame::OnCloseWindow

void OnCloseWindow(**wxCloseEvent&** *event*)

Deletes all views and documents. If no user input cancelled the operation, the frame will be destroyed and the application will exit.

Since understanding how document/view clean-up takes place can be difficult, the implementation of this function is shown below.

```
void wxDocParentFrame::OnCloseWindow(wxCloseEvent& event)
{
  if (m_docManager->Clear(!event.CanVeto()))
  {
    this->Destroy();
  }
  else
    event.Veto();
}
```

wxDocParentFrame

The wxDocParentFrame class provides a default top-level frame for applications using the document/view framework. This class can only be used for SDI (not MDI) parent frames.

It cooperates with the *wxView* (p. 1184), *wxDocument* (p. 353), *wxDocManager* (p. 334)

and *wxDocTemplates* (p. 348) classes.

See the example application in `samples/docview`.

wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/docview.h>

See also

Document/view overview (p. 1411), *wxFrame* (p. 454)

wxDocParentFrame::wxDocParentFrame

 wxDocParentFrame (**wxDocManager*** *manager*, **wxFrame ****parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE*, **const wxString&** *name* = *"frame"*)

Constructor.

wxDocParentFrame::~wxDocParentFrame

 ~wxDocParentFrame ()

Destructor.

wxDocParentFrame::OnCloseWindow

void OnCloseWindow (**wxCloseEvent&** *event*)

Deletes all views and documents. If no user input cancelled the operation, the frame will be destroyed and the application will exit.

Since understanding how document/view clean-up takes place can be difficult, the implementation of this function is shown below.

```
void wxDocParentFrame::OnCloseWindow(wxCloseEvent& event)
```

```
{
  if (m_docManager->Clear(!event.CanVeto()))
  {
    this->Destroy();
  }
  else
    event.Veto();
}
```

wxDocTemplate

The wxDocTemplate class is used to model the relationship between a document class and a view class.

Derived from

wxObject (p. 750)

Include files

<wx/docview.h>

See also

wxDocTemplate overview (p. 1414), *wxDocument* (p. 353), *wxView* (p. 1184)

wxDocTemplate::m_defaultExt

wxString m_defaultExt

The default extension for files of this type.

wxDocTemplate::m_description

wxString m_description

A short description of this template.

wxDocTemplate::m_directory

wxString m_directory

The default directory for files of this type.

wxDocTemplate::m_docClassInfo

wxClassInfo* m_docClassInfo

Run-time class information that allows document instances to be constructed dynamically.

wxDocTemplate::m_docTypeName

wxString m_docTypeName

The named type of the document associated with this template.

wxDocTemplate::m_documentManager

wxDocTemplate* m_documentManager

A pointer to the document manager for which this template was created.

wxDocTemplate::m_fileFilter

wxString m_fileFilter

The file filter (such as `*.txt`) to be used in file selector dialogs.

wxDocTemplate::m_flags

long m_flags

The flags passed to the constructor.

wxDocTemplate::m_viewClassInfo

wxClassInfo* m_viewClassInfo

Run-time class information that allows view instances to be constructed dynamically.

wxDocTemplate::m_viewTypeName

wxString m_viewTypeName

The named type of the view associated with this template.

wxDocTemplate::wxDocTemplate

 wxDocTemplate(**wxDocManager*** *manager*, **const wxString&** *descr*, **const wxString&** *filter*, **const wxString&** *dir*, **const wxString&** *ext*, **const wxString&** *docTypeName*, **const wxString&** *viewTypeName*, **wxClassInfo*** *docClassInfo = NULL*, **wxClassInfo*** *viewClassInfo = NULL*, **long** *flags = wxDEFAULT_TEMPLATE_FLAGS*)

Constructor. Create instances dynamically near the start of your application after creating a wxDocManager instance, and before doing any document or view operations.

manager is the document manager object which manages this template.

descr is a short description of what the template is for. This string will be displayed in the file filter list of Windows file selectors.

filter is an appropriate file filter such as `*.txt`.

dir is the default directory to use for file selectors.

ext is the default file extension (such as txt).

docTypeName is a name that should be unique for a given type of document, used for gathering a list of views relevant to a particular document.

viewTypeName is a name that should be unique for a given view.

docClassInfo is a pointer to the run-time document class information as returned by the CLASSINFO macro, e.g. CLASSINFO(MyDocumentClass). If this is not supplied, you will need to derive a new wxDocTemplate class and override the CreateDocument member to return a new document instance on demand.

viewClassInfo is a pointer to the run-time view class information as returned by the CLASSINFO macro, e.g. CLASSINFO(MyViewClass). If this is not supplied, you will need to derive a new wxDocTemplate class and override the CreateView member to return a new view instance on demand.

flags is a bit list of the following:

- wxTEMPLATE_VISIBLE The template may be displayed to the user in dialogs.
- wxTEMPLATE_INVISIBLE The template may not be displayed to the user in dialogs.
- wxDEFAULT_TEMPLATE_FLAGS Defined as wxTEMPLATE_VISIBLE.

wxDocTemplate::~wxDocTemplate

void ~wxDocTemplate()

Destructor.

wxDocTemplate::CreateDocument

wxDocument * CreateDocument(**const wxString&** *path*, **long** *flags = 0*)

Creates a new instance of the associated document class. If you have not supplied a wxClassInfo parameter to the template constructor, you will need to override this function to return an appropriate document instance.

wxDocTemplate::CreateView

wxView * CreateView(**wxDocument ****doc*, **long** *flags = 0*)

Creates a new instance of the associated view class. If you have not supplied a wxClassInfo parameter to the template constructor, you will need to override this function to return an appropriate view instance.

wxDocTemplate::GetDefaultExtension

wxString GetDefaultExtension()

Returns the default file extension for the document data, as passed to the document template constructor.

wxDocTemplate::GetDescription

wxString GetDescription()

Returns the text description of this template, as passed to the document template constructor.

wxDocTemplate::GetDirectory

wxString GetDirectory()

Returns the default directory, as passed to the document template constructor.

wxDocTemplate::GetDocumentManager

wxDocManager * GetDocumentManager()

Returns a pointer to the document manager instance for which this template was created.

wxDocTemplate::GetDocumentName

wxString GetDocumentName ()

Returns the document type name, as passed to the document template constructor.

wxDocTemplate::GetFileFilter

wxString GetFileFilter()

Returns the file filter, as passed to the document template constructor.

wxDocTemplate::GetFlags

long GetFlags()

Returns the flags, as passed to the document template constructor.

wxDocTemplate::GetViewName

wxString GetViewName ()

Returns the view type name, as passed to the document template constructor.

wxDocTemplate::IsVisible

bool IsVisible()

Returns TRUE if the document template can be shown in user dialogs, FALSE otherwise.

wxDocTemplate::SetDefaultExtension

void SetDefaultExtension(const wxString& *ext*)

Sets the default file extension.

wxDocTemplate::SetDescription

void SetDescription(**const wxString&** *descr*)

Sets the template description.

wxDocTemplate::SetDirectory

void SetDirectory(**const wxString&** *dir*)

Sets the default directory.

wxDocTemplate::SetDocumentManager

void SetDocumentManager(**wxDocManager** ** manager*)

Sets the pointer to the document manager instance for which this template was created. Should not be called by the application.

wxDocTemplate::SetFileFilter

void SetFileFilter(**const wxString&** *filter*)

Sets the file filter.

wxDocTemplate::SetFlags

void SetFlags(**long** *flags*)

Sets the internal document template flags (see the constructor description for more details).

wxDocument

The document class can be used to model an application's file-based data. It is part of the document/view framework supported by wxWindows, and cooperates with the *wxView* (p. 1184), *wxDocTemplate* (p. 348) and *wxDocManager* (p. 334) classes.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/docview.h>

See also

wxDocument overview (p. 1412), *wxView* (p. 1184), *wxDocTemplate* (p. 348), *wxDocManager* (p. 334)

wxDocument::m_commandProcessor

wxCommandProcessor* m_commandProcessor

A pointer to the command processor associated with this document.

wxDocument::m_documentFile

wxString m_documentFile

Filename associated with this document ("" if none).

wxDocument::m_documentModified

bool m_documentModified

TRUE if the document has been modified, FALSE otherwise.

wxDocument::m_documentTemplate

wxDocTemplate * m_documentTemplate

A pointer to the template from which this document was created.

wxDocument::m_documentTitle

wxString m_documentTitle

Document title. The document title is used for an associated frame (if any), and is usually constructed by the framework from the filename.

wxDocument::m_documentTypeName

wxString m_documentTypeName

The document type name given to the wxDocTemplate constructor, copied to this variable when the document is created. If several document templates are created that use the same document type, this variable is used in wxDocManager::CreateView to collate a list of alternative view types that can be used on this kind of document. Do not change the value of this variable.

wxDocument::m_documentViews

wxList m_documentViews

List of wxView instances associated with this document.

wxDocument::wxDocument

wxDocument()

Constructor. Define your own default constructor to initialize application-specific data.

wxDocument::~wxDocument

~wxDocument()

Destructor. Removes itself from the document manager.

wxDocument::AddView

virtual bool AddView(wxView *view)

If the view is not already in the list of views, adds the view and calls OnChangedViewList.

wxDocument::Close

virtual bool Close()

Closes the document, by calling OnSaveModified and then (if this returned TRUE) OnCloseDocument. This does not normally delete the document object: use DeleteAllViews to do this implicitly.

wxDocument::DeleteAllViews

virtual bool DeleteAllViews()

Calls wxView::Close and deletes each view. Deleting the final view will implicitly delete the document itself, because the wxView destructor calls RemoveView. This in turns calls wxDocument::OnChangedViewList, whose default implementation is to save and delete the document if no views exist.

wxDocument::GetCommandProcessor

wxCommandProcessor* GetCommandProcessor() **const**

Returns a pointer to the command processor associated with this document.

See *wxCommandProcessor* (p. 158).

wxDocument::GetDocumentTemplate

wxDocTemplate* GetDocumentTemplate() **const**

Gets a pointer to the template that created the document.

wxDocument::GetDocumentManager

wxDocManager* GetDocumentManager() **const**

Gets a pointer to the associated document manager.

wxDocument::GetDocumentName

wxString GetDocumentName() **const**

Gets the document type name for this document. See the comment for *documentTypeName* (p. 354).

wxDocument::GetDocumentWindow

wxWindow* GetDocumentWindow() **const**

Intended to return a suitable window for using as a parent for document-related dialog boxes. By default, uses the frame associated with the first view.

wxDocument::GetFilename

wxString GetFilename() **const**

Gets the filename associated with this document, or "" if none is associated.

wxDocument::GetFirstView

wxView * GetFirstView() **const**

A convenience function to get the first view for a document, because in many cases a document will only have a single view.

See also: *GetViews* (p. 357)

wxDocument::GetPrintableName

virtual void GetPrintableName(**wxString&** *name*) **const**

Copies a suitable document name into the supplied *name* buffer. The default function uses the title, or if there is no title, uses the filename; or if no filename, the string **unnamed**.

wxDocument::GetTitle

wxString GetTitle() **const**

Gets the title for this document. The document title is used for an associated frame (if any), and is usually constructed by the framework from the filename.

wxDocument::GetViews

wxList & GetViews() **const**

Returns the list whose elements are the views on the document.

See also: *GetFirstView* (p. 357)

wxDocument::IsModified

virtual bool IsModified() **const**

Returns TRUE if the document has been modified since the last save, FALSE otherwise. You may need to override this if your document view maintains its own record of being modified (for example if using wxTextWindow to view and edit the document).

See also *Modify* (p. 358).

wxDocument::LoadObject

virtual istream& LoadObject(**istream&** *stream*)

virtual wxInputStream& LoadObject(**wxInputStream&** *stream*)

Override this function and call it from your own LoadObject before streaming your own data. LoadObject is called by the framework automatically when the document contents need to be loaded.

Note that only one of these forms exists, depending on how wxWindows was configured.

wxDocument::Modify

virtual void Modify(**bool** *modify*)

Call with TRUE to mark the document as modified since the last save, FALSE otherwise. You may need to override this if your document view maintains its own record of being modified (for example if using wxTextWindow to view and edit the document).

See also *IsModified* (p. 357).

wxDocument::OnChangedViewList

virtual void OnChangedViewList()

Called when a view is added to or deleted from this document. The default implementation saves and deletes the document if no views exist (the last one has just been removed).

wxDocument::OnCloseDocument

virtual bool OnCloseDocument()

The default implementation calls DeleteContents (an empty implementation) sets the modified flag to FALSE. Override this to supply additional behaviour when the document is closed with Close.

wxDocument::OnCreate

virtual bool OnCreate(**const wxString&** *path*, **long** *flags*)

Called just after the document object is created to give it a chance to initialize itself. The default implementation uses the template associated with the document to create an

initial view. If this function returns FALSE, the document is deleted.

wxDocument::OnCreateCommandProcessor

virtual wxCommandProcessor* OnCreateCommandProcessor()

Override this function if you want a different (or no) command processor to be created when the document is created. By default, it returns an instance of wxCommandProcessor.

See *wxCommandProcessor* (p. 158).

wxDocument::OnNewDocument

virtual bool OnNewDocument()

The default implementation calls OnSaveModified and DeleteContents, makes a default title for the document, and notifies the views that the filename (in fact, the title) has changed.

wxDocument::OnOpenDocument

virtual bool OnOpenDocument(const wxString& *filename*)

Constructs an input file stream for the given filename (which must not be empty), and calls LoadObject. If LoadObject returns TRUE, the document is set to unmodified; otherwise, an error message box is displayed. The document's views are notified that the filename has changed, to give windows an opportunity to update their titles. All of the document's views are then updated.

wxDocument::OnSaveDocument

virtual bool OnSaveDocument(const wxString& *filename*)

Constructs an output file stream for the given filename (which must not be empty), and calls SaveObject. If SaveObject returns TRUE, the document is set to unmodified; otherwise, an error message box is displayed.

wxDocument::OnSaveModified

virtual bool OnSaveModified()

If the document has been modified, prompts the user to ask if the changes should be changed. If the user replies Yes, the Save function is called. If No, the document is marked as unmodified and the function succeeds. If Cancel, the function fails.

wxDocument::RemoveView

virtual bool RemoveView(wxView* *view*)

Removes the view from the document's list of views, and calls OnChangedViewList.

wxDocument::Save

virtual bool Save()

Saves the document by calling OnSaveDocument if there is an associated filename, or SaveAs if there is no filename.

wxDocument::SaveAs

virtual bool SaveAs()

Prompts the user for a file to save to, and then calls OnSaveDocument.

wxDocument::SaveObject

virtual ostream& SaveObject(ostream& *stream*)

virtual wxOutputStream& SaveObject(wxOutputStream& *stream*)

Override this function and call it from your own SaveObject before streaming your own data. SaveObject is called by the framework automatically when the document contents need to be saved.

Note that only one of these forms exists, depending on how wxWindows was configured.

wxDocument::SetCommandProcessor

virtual void SetCommandProcessor(wxCommandProcessor *processor*)

Sets the command processor to be used for this document. The document will then be responsible for its deletion. Normally you should not call this; override OnCreateCommandProcessor instead.

See *wxCommandProcessor* (p. 158).

wxDocument::SetDocumentName

void SetDocumentName(**const wxString&** *name*)

Sets the document type name for this document. See the comment for *documentTypeName* (p. 354).

wxDocument::SetDocumentTemplate

void SetDocumentTemplate(**wxDocTemplate*** *templ*)

Sets the pointer to the template that created the document. Should only be called by the framework.

wxDocument::SetFilename

void SetFilename(**const wxString&** *filename*, **bool** *notifyViews = FALSE*)

Sets the filename for this document. Usually called by the framework.

If *notifyViews* is TRUE, wxView::OnChangeFilename is called for all views.

wxDocument::SetTitle

void SetTitle(**const wxString&** *title*)

Sets the title for this document. The document title is used for an associated frame (if any), and is usually constructed by the framework from the filename.

wxDocument::UpdateAllViews

void UpdateAllViews(**wxView*** *sender = NULL*)

Updates all views. If *sender* is non-NULL, does not update this view.

wxDragImage

This class is used when you wish to drag an object on the screen, and a simple cursor is not enough.

On Windows, the WIN32 API is used to do achieve smooth dragging. On other platforms, wxGenericDragImage is used. Applications may also prefer to use wxGenericDragImage on Windows, too.

wxPython note: wxPython uses wxGenericDragImage on all platforms, but uses the wxDragImage name.

To use this class, when you wish to start dragging an image, create a wxDragImage object and store it somewhere you can access it as the drag progresses. Call BeginDrag to start, and EndDrag to stop the drag. To move the image, initially call Show and then Move. If you wish to update the screen contents during the drag (for example, highlight an item as in the dragimag sample), first call Hide, update the screen, call Move, and then call Show.

You can drag within one window, or you can use full-screen dragging either across the whole screen, or just restricted to one area of the screen to save resources. If you want the user to drag between two windows, then you will need to use full-screen dragging.

If you wish to draw the image yourself, use wxGenericDragImage and override *wxDragImage::DoDrawImage* (p. 364) and *wxDragImage::GetImageRect* (p. 365).

Please see `samples/dragimag` for an example.

Derived from

wxObject (p. 750)

Include files

<wx/dragimag.h>
<wx/generic/dragimgg.h>

wxDragImage::wxDragImage

wxDragImage()

Default constructor.

wxDragImage(**const wxBitmap&** *image*, **const wxCursor&** *cursor = wxNullCursor*, **const wxPoint&** *hotspot = wxPoint(0, 0)*)

Constructs a drag image from a bitmap and optional cursor.

wxDragImage(**const wxIcon&** *image*, **const wxCursor&** *cursor = wxNullCursor*, **const wxPoint&** *hotspot = wxPoint(0, 0)*)

Constructs a drag image from an icon and optional cursor.

wxPython note: This constructor is called wxDragIcon in wxPython.

wxDragImage(**const wxString&** *text*, **const wxCursor&** *cursor = wxNullCursor*, **const wxPoint&***hotspot = wxPoint(0, 0)*)

Constructs a drag image from a text string and optional cursor.

wxPython note: This constructor is called wxDragString in wxPython.

wxDragImage(**const wxTreeCtrl&** *treeCtrl*, **wxTreeItemId&** *id*)

Constructs a drag image from the text in the given tree control item, and optional cursor.

wxPython note: This constructor is called wxDragTreeItem in wxPython.

wxDragImage(**const wxListCtrl&** *treeCtrl*, **long** *id*)

Constructs a drag image from the text in the given tree control item, and optional cursor.

wxPython note: This constructor is called wxDragListItem in wxPython.

wxDragImage(**const wxCursor&** *cursor = wx NullCursor*, **const wxPoint&***hotspot = wxPoint(0, 0)*)

Constructs a drag image an optional cursor. This constructor is only available for wxGenericDragImage, and can be used when the application supplies *wxDragImage::DoDrawImage* (p. 364) and *wxDragImage::GetImageRect* (p. 365).

Parameters

image
 Icon or bitmap to be used as the drag image. The bitmap can have a mask.

text
 Text used to construct a drag image.

cursor
 Optional cursor to combine with the image.

hotspot
 Position of the hotspot within the new image.

treeCtrl
 Tree control for constructing a tree drag image.

listCtrl
 List control for constructing a list drag image.

id
 Tree or list control item id.

wxDragImage::BeginDrag

bool BeginDrag(**const wxPoint&** *hotspot*, **wxWindow*** *window*, **bool** *fullScreen* = *FALSE*, **wxRect*** *rect* = *NULL*)

Start dragging the image, in a window or full screen.

bool BeginDrag(**const wxPoint&** *hotspot*, **wxWindow*** *window*, **wxWindow*** *boundingWindow*)

Start dragging the image, using the first window to capture the mouse and the second to specify the bounding area. This form is equivalent to using the first form, but more convenient than working out the bounding rectangle explicitly.

You need to then call *wxDragImage::Show* (p. 365) and *wxDragImage::Move* (p. 365) to show the image on the screen.

Call *wxDragImage::EndDrag* (p. 365) when the drag has finished.

Note that this call automatically calls CaptureMouse.

Parameters

hotspot
> The location of the drag position relative to the upper-left corner of the image.

window
> The window that captures the mouse, and within which the dragging is limited unless *fullScreen* is TRUE.

boundingWindow
> In the second form of the function, specifies the area within which the drag occurs.

fullScreen
> If TRUE, specifies that the drag will be visible over the full screen, or over as much of the screen as is specified by *rect*. Note that the mouse will still be captured in *window*.

rect
> If non-NULL, specifies the rectangle (in screen coordinates) that bounds the dragging operation. Specifying this can make the operation more efficient by cutting down on the area under consideration, and it can also make a visual difference since the drag is clipped to this area.

wxDragImage::DoDrawImage

virtual bool DoDrawImage(**wxDC&** *dc*, **const wxPoint&** *pos*)

Draws the image on the device context with top-left corner at the given position.

This function is only available with wxGenericDragImage, to allow applications to draw

their own image instead of using an actual bitmap. If you override this function, you must also override *wxDragImage::GetImageRect* (p. 365).

wxDragImage::EndDrag

bool EndDrag()

Call this when the drag has finished.

Note that this call automatically calls ReleaseMouse.

wxDragImage::GetImageRect

virtual wxRect GetImageRect(const wxPoint& *pos*) const

Returns the rectangle enclosing the image, assuming that the image is drawn with its top-left corner at the given point.

This function is available in wxGenericDragImage only, and may be overridden (together with *wxDragImage::DoDrawImage* (p. 364)) to provide a virtual drawing capability.

wxDragImage::Hide

bool Hide()

Hides the image. You may wish to call this before updating the window contents (perhaps highlighting an item). Then call *wxDragImage::Move* (p. 365) and *wxDragImage::Show* (p. 365).

wxDragImage::Move

bool Move(const wxPoint& *pt*)

Call this to move the image to a new position. The image will only be shown if *wxDragImage::Show* (p. 365) has been called previously (for example at the start of the drag).

pt is the position in window coordinates (or screen coordinates if no window was specified to BeginDrag.

You can move the image either when the image is hidden or shown, but in general dragging will be smoother if you move the image when it is shown.

wxDragImage::Show

bool Show()

Shows the image. Call this at least once when dragging.

wxDragImage::UpdateBackingFromWindow

bool UpdateBackingFromWindow(**wxDC&** *windowDC*, **wxMemoryDC&** *destDC*,
const wxRect& *sourceRect*, **const wxRect&** *destRect*) **const**

Override this if you wish to draw the window contents to the backing bitmap yourself.
This can be desirable if you wish to avoid flicker by not having to redraw the updated
window itself just before dragging, which can cause a flicker just as the drag starts.
Instead, paint the drag image's backing bitmap to show the appropriate graphic *minus
the objects to be dragged*, and leave the window itself to be updated by the drag image.
This can provide eerily smooth, flicker-free drag behaviour.

The default implementation copies the window contents to the backing bitmap. A new
implementation will normally copy information from another source, such as from its own
backing bitmap if it has one, or directly from internal data structures.

This function is available in wxGenericDragImage only.

wxDropFilesEvent

This class is used for drop files events, that is, when files have been dropped onto the
window. This functionality is currently only available under Windows.

Important note: this is a separate implementation to the more general drag and drop
implementation documented *here* (p. 1430). It uses the older, Windows message-based
approach of dropping files.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a drop files event, use these event handler macros to direct input to a
member function that takes a wxDropFilesEvent argument.

EVT_DROP_FILES(func)   Process a wxEVT_DROP_FILES event.

See also

wxWindow::OnDropFiles (p. 1214), *Event handling overview*(p. 1372)

wxDropFilesEvent::wxDropFilesEvent

wxDropFilesEvent(**WXTYPE** *id = 0*, **int** *noFiles = 0*, **wxString*** *files = NULL*)

Constructor.

wxDropFilesEvent::m_files

wxString* m_files

An array of filenames.

wxDropFilesEvent::m_noFiles

int m_noFiles

The number of files dropped.

wxDropFilesEvent::m_pos

wxPoint m_pos

The point at which the drop took place.

wxDropFilesEvent::GetFiles

wxString* GetFiles() **const**

Returns an array of filenames.

wxDropFilesEvent::GetNumberOfFiles

int GetNumberOfFiles() **const**

Returns the number of files dropped.

wxDropFilesEvent::GetPosition

wxPoint GetPosition() **const**

Returns the position at which the files were dropped.

Returns an array of filenames.

wxDropSource

This class represents a source for a drag and drop operation.

See *Drag and drop overview*(p. 1430) and *wxDataObject overview*(p. 1432) for more information.

Derived from

None

Include files

<wx/dnd.h>

Types

wxDragResult is defined as follows:

```
enum wxDragResult
{
    wxDragError,    // error prevented the d&d operation from
completing
    wxDragNone,     // drag target didn't accept the data
    wxDragCopy,     // the data was successfully copied
    wxDragMove,     // the data was successfully moved
    wxDragCancel    // the operation was cancelled by user (not an
error)
};
```

See also

wxDropTarget (p. 370), *wxTextDropTarget* (p. 1096), *wxFileDropTarget* (p. 414)

wxDropSource::wxDropSource

wxDropSource(**wxWindow*** *win = NULL*,**const wxIconOrCursor&** *iconCopy = wxNullIconOrCursor*, **const wxIconOrCursor&** *iconCopy = wxNullIconOrCursor*, **const wxIconOrCursor&** *iconNone = wxNullIconOrCursor*)

wxDropSource(**wxDataObject&** *data*, **wxWindow*** *win = NULL*,**const wxIconOrCursor&** *iconCopy = wxNullIconOrCursor*, **const wxIconOrCursor&** *iconCopy = wxNullIconOrCursor*, **const wxIconOrCursor&** *iconNone = wxNullIconOrCursor*)

The constructors for wxDataObject.

If you use the constructor without *data* parameter you must call *SetData* (p. 369) later.

Note that the exact type of *iconCopy* and subsequent parameters differs between wxMSW and wxGTK: these are cursors under Windows but icons for GTK. You should use the macro *wxDROP_ICON* (p. 1274) in portable programs instead of directly using either of these types.

Parameters

win
    The window which initiates the drag and drop operation.

iconCopy
    The icon or cursor used for feedback for copy operation.

iconMove
    The icon or cursor used for feedback for move operation.

iconNone
    The icon or cursor used for feedback when operation can't be done.

win is the window which initiates the drag and drop operation.

wxDropSource::~wxDropSource

virtual ~wxDropSource()

wxDropSource::SetData

void SetData(**wxDataObject&** *data*)

Sets the data *wxDataObject* (p. 197) associated with the drop source. This will not delete any previously associated data.

wxDropSource::DoDragDrop

virtual wxDragResult DoDragDrop(**bool** *allowMove* = *FALSE*)

Do it (call this in response to a mouse button press, for example).

If **allowMove** is FALSE, data can only be copied.

wxDropSource::GiveFeedback

virtual bool GiveFeedback(**wxDragResult** *effect*, **bool** *scrolling*)

Overridable: you may give some custom UI feedback during the drag and drop operation in this function. It is called on each mouse move, so your implementation must not be too slow.

Parameters

effect
> The effect to implement. One of wxDragCopy, wxDragMove and wxDragNone.

scrolling
> TRUE if the window is scrolling. MSW only.

Return value

Return FALSE if you want default feedback, or TRUE if you implement your own feedback. The return values is ignored under GTK.

wxDropTarget

This class represents a target for a drag and drop operation. A *wxDataObject* (p. 197)can be associated with it and by default, this object will be filled with the data from the drag source, if the data formats supported by the data object match the drag source data format.

There are various virtual handler functions defined in this class which may be overridden to give visual feedback or react in a more fine-tuned way, e.g. by not accepting data on the whole window area, but only a small portion of it. The normal sequence of calls is *OnEnter* (p. 372), possibly many times *OnDragOver* (p. 373), *OnDrop* (p. 372) and finally *OnData* (p. 372).

See *Drag and drop overview* (p. 1430) and *wxDataObject overview* (p. 1432)for more information.

Derived from

None

Include files

<wx/dnd.h>

Types

wxDragResult is defined as follows:

```
enum wxDragResult
{
    wxDragError,    // error prevented the d&d operation from
completing
    wxDragNone,     // drag target didn't accept the data
    wxDragCopy,     // the data was successfully copied
    wxDragMove,     // the data was successfully moved
    wxDragCancel    // the operation was cancelled by user (not an
error)
};
```

See also

wxDropSource (p. 368), *wxTextDropTarget* (p. 1096), *wxFileDropTarget* (p. 414), *wxDataFormat* (p. 195), *wxDataObject* (p. 197)

wxDropTarget::wxDropTarget

wxDropTarget(**wxDataObject*** *data = NULL*)

Constructor. *data* is the data to be associated with the drop target.

wxDropTarget::~wxDropTarget

~wxDropTarget()

Destructor. Deletes the associated data object, if any.

wxDropTarget::GetData

virtual void GetData()

This method may only be called from within *OnData* (p. 372). By default, this method copies the data from the drop source to the *wxDataObject* (p. 197) associated with this drop target, calling its *wxDataObject::SetData* (p. 200) method.

wxDropTarget::OnData

virtual wxDragResult OnData(**wxCoord** *x*, **wxCoord** *y*, **wxDragResult** *def*)

Called after *OnDrop* (p. 372) returns TRUE. By default this will usually *GetData* (p. 371) and will return the suggested default value *def*.

wxDropTarget::OnDrop

virtual bool OnDrop(**wxCoord** *x*, **wxCoord** *y*)

Called when the user drops a data object on the target. Return FALSE to veto the operation.

Parameters

x

The x coordinate of the mouse.

y

The y coordinate of the mouse.

Return value

Return TRUE to accept the data, FALSE to veto the operation.

wxDropTarget::OnEnter

virtual wxDragResult OnEnter(**wxCoord** *x*, **wxCoord** *y*, **wxDragResult** *def*)

Called when the mouse enters the drop target. By default, this calls *OnDragOver* (p. 373).

Parameters

x

The x coordinate of the mouse.

y

The y coordinate of the mouse.

def

Suggested default for return value. Determined by SHIFT or CONTROL key states.

Return value

Returns the desired operation or `wxDragNone`. This is used for optical feedback from

the side of the drop source, typically in form of changing the icon.

wxDropTarget::OnDragOver

virtual wxDragResult OnDragOver(**wxCoord** *x*, **wxCoord** *y*, **wxDragResult** *def*)

Called when the mouse is being dragged over the drop target. By default, this calls functions return the suggested return value *def*.

Parameters

x

The x coordinate of the mouse.

y

The y coordinate of the mouse.

def

Suggested value for return value. Determined by SHIFT or CONTROL key states.

Return value

Returns the desired operation or `wxDragNone`. This is used for optical feedback from the side of the drop source, typically in form of changing the icon.

wxDropTarget::OnLeave

virtual void OnLeave()

Called when the mouse leaves the drop target.

wxDropTarget::SetDataObject

void SetDataObject(**wxDataObject*** *data*)

Sets the data *wxDataObject* (p. 197) associated with the drop target and deletes any previously associated data object.

wxEncodingConverter

This class is capable of converting strings between any two 8-bit encodings/charsets. It can also convert from/to Unicode (but only if you compiled wxWindows with wxUSE_WCHAR_T set to 1).

Derived from

wxObject (p. 750)

Include files

<wx/encconv.h>

See also

wxFontMapper (p. 451), *wxMBConv* (p. 665), *Writing non-English applications* (p. 1354)

wxEncodingConverter::wxEncodingConverter

wxEncodingConverter()

Constructor.

wxEncodingConverter::Init

bool Init(**wxFontEncoding** *input_enc*, **wxFontEncoding** *output_enc*, **int** *method* = *wxCONVERT_STRICT*)

Initialize convertion. Both output or input encoding may be wxFONTENCODING_UNICODE, but only if wxUSE_ENCODING is set to 1. All subsequent calls to *Convert()* (p. 375) will interpret its argument as a string in *input_enc* encoding and will output string in *output_enc* encoding. You must call this method before calling Convert. You may call it more than once in order to switch to another conversion. *Method* affects behaviour of Convert() in case input character cannot be converted because it does not exist in output encoding:

wxCONVERT_STRICT	follow behaviour of GNU Recode - just copy unconvertible characters to output and don't change them (its integer value will stay the same)
wxCONVERT_SUBSTITUTE	try some (lossy) substitutions - e.g. replace unconvertible latin capitals with acute by ordinary capitals, replace en-dash or em-dash by '-' etc.

Both modes guarantee that output string will have same length as input string.

Return value

FALSE if given conversion is impossible, TRUE otherwise (conversion may be

impossible either if you try to convert to Unicode with non-Unicode build of wxWindows or if input or output encoding is not supported.)

wxEncodingConverter::Convert

wxString Convert(**const wxString&** *input*)

void Convert(**const wxChar*** *input*, **wxChar*** *output*)

void Convert(**wxChar*** *str*)

void Convert(**const char*** *input*, **wxChar*** *output*)

Convert input string according to settings passed to *Init* (p. 374). Note that you must call Init before using Convert!

wxEncodingConverter::GetPlatformEquivalents

static wxFontEncodingArray GetPlatformEquivalents(**wxFontEncoding** *enc*, **int** *platform = wxPLATFORM_CURRENT*)

Return equivalents for given font that are used under given platform. Supported platforms:

- wxPLATFORM_UNIX
- wxPLATFORM_WINDOWS
- wxPLATFORM_OS2
- wxPLATFORM_MAC
- wxPLATFORM_CURRENT

wxPLATFORM_CURRENT means the plaform this binary was compiled for.

Examples:

```
current platform   enc           returned value
------------------------------------------------
unix          CP1250              {ISO8859_2}
unix        ISO8859_2             {ISO8859_2}
windows     ISO8859_2               {CP1250}
unix          CP1252  {ISO8859_1,ISO8859_15}
```

Equivalence is defined in terms of convertibility: two encodings are equivalent if you can convert text between then without losing information (it may - and will - happen that you lose special chars like quotation marks or em-dashes but you shouldn't lose any diacritics and language-specific characters when converting between equivalent encodings).

Remember that this function does **NOT** check for presence of fonts in system. It only tells you what are most suitable encodings. (It usually returns only one encoding.)

Notes

- Note that argument *enc* itself may be present in the returned array, so that you can, as a side-effect, detect whether the encoding is native for this platform or not.
- *Convert* (p. 375) is not limited to converting between equivalent encodings, it can convert between two arbitrary encodings.
- If *enc* is present in the returned array, then it is **always** the first item of it.
- Please note that the returned array may contain no items at all.

wxEncodingConverter::GetAllEquivalents

static wxFontEncodingArray GetAllEquivalents(**wxFontEncoding** *enc*)

Similar to *GetPlatformEquivalents* (p. 375), but this one will return ALL equivalent encodings, regardless of the platform, and including itself.

This platform's encodings are before others in the array. And again, if *enc* is in the array, it is the very first item in it.

wxEraseEvent

An erase event is sent when a window's background needs to be repainted.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process an erase event, use this event handler macro to direct input to a member function that takes a wxEraseEvent argument.

EVT_ERASE_BACKGROUND(func)   Process a wxEVT_ERASE_BACKGROUND event.

Remarks

If the **m_DC** member is non-NULL, draw into this device context.

See also

wxWindow::OnEraseBackground (p. 1215), *Event handling overview* (p. 1372)

wxEraseEvent::wxEraseEvent

wxEraseEvent(**int** *id = 0*, **wxDC*** *dc = NULL*)

Constructor.

wxEraseEvent::m_dc

wxDC* m_dc

The device context associated with the erase event (may be NULL).

wxEraseEvent::GetDC

wxDC* GetDC() **const**

Returns the device context to draw into. If this is non-NULL, you should draw into it to perform the erase operation.

wxEvent

An event is a structure holding information about an event passed to a callback or member function. **wxEvent** used to be a multipurpose event object, and is an abstract base class for other event classes (see below).

Derived from

wxObject (p. 750)

Include files

<wx/event.h>

See also

wxCommandEvent (p. 153), *wxMouseEvent* (p. 725)

wxEvent::wxEvent

 wxEvent(**int** *id = 0*)

Constructor. Should not need to be used directly by an application.

wxEvent::m_eventHandle

char* m_eventHandle

Handle of an underlying windowing system event handle, such as XEvent. Not guaranteed to be instantiated.

wxEvent::m_eventObject

wxObject* m_eventObject

The object (usually a window) that the event was generated from, or should be sent to.

wxEvent::m_eventType

WXTYPE m_eventType

The type of the event, such as wxEVENT_TYPE_BUTTON_COMMAND.

wxEvent::m_id

int m_id

Identifier for the window.

wxEvent::m_skipped

bool m_skipped

Set to TRUE by **Skip** if this event should be skipped.

wxEvent::m_timeStamp

long m_timeStamp

Timestamp for this event.

wxEvent::GetEventObject

wxObject* GetEventObject()

Returns the object associated with the event, if any.

wxEvent::GetEventType

WXTYPE GetEventType()

Returns the identifier of the given event type, such as
wxEVENT_TYPE_BUTTON_COMMAND.

wxEvent::GetId

int GetId()

Returns the identifier associated with this event, such as a button command id.

wxEvent::GetObjectType

WXTYPE GetObjectType()

Returns the type of the object associated with the event, such as wxTYPE_BUTTON.

wxEvent::GetSkipped

bool GetSkipped()

Returns TRUE if the event handler should be skipped, FALSE otherwise.

wxEvent::GetTimestamp

long GetTimestamp()

Gets the timestamp for the event.

wxEvent::SetEventObject

void SetEventObject(**wxObject*** *object*)

Sets the originating object.

wxEvent::SetEventType

void SetEventType(**WXTYPE** *typ*)

Sets the event type.

wxEvent::SetId

void SetId(**int** *id*)

Sets the identifier associated with this event, such as a button command id.

wxEvent::SetTimestamp

void SetTimestamp(**long** *timeStamp*)

Sets the timestamp for the event.

Sets the originating object.

wxEvent::Skip

void Skip(**bool** *skip* = *TRUE*)

Called by an event handler to tell the event system that the event handler should be skipped, and the next valid handler used instead.

wxEvtHandler

A class that can handle events from the windowing system. wxWindow (and therefore all window classes) are derived from this class.

Derived from

wxObject (p. 750)

Include files

<wx/event.h>

See also

Event handling overview (p. 1372)

wxEvtHandler::wxEvtHandler

wxEvtHandler()

Constructor.

wxEvtHandler::~wxEvtHandler

~wxEvtHandler()

Destructor. If the handler is part of a chain, the destructor will unlink itself and restore the previous and next handlers so that they point to each other.

wxEvtHandler::AddPendingEvent

virtual void AddPendingEvent(**wxEvent&** *event*)

Adds an event to be processed later. The function will return immediately and the event will get processed in idle time using the *wxEvtHandler::ProcessEvent* (p. 384) method.

Parameters

event
    Event to add to process queue.

Remarks

Note that this requires that the event has a fully implemented Clone() method so that the event can be duplicated and stored until it gets processed later. Not all events in wxWindows currently have a fully implemented Clone() method, so you may have to look at the source to verify this.

This methods automatically wakes up idle handling even if the underlying window system is currently idle anyway and thus would not send any idle events. (Waking up the idle handling is done calling *::wxWakeUpIdle* (p. 1291).)

This is also the method to call for inter-thread communication. In a multi-threaded program, you will often have to inform the main GUI thread about the status of other working threads and this has to be done using this method - which also means that this

method is thread safe by means of using crtical sections where needed.

Furthermore, it may be noted that some ports of wxWindows will probably move to using this method more and more in preference over calling ProcessEvent() directly so as to avoid problems with reentrant code.

wxEvtHandler::Connect

void Connect(**int** *id*, **wxEventType** *eventType*, **wxObjectEventFunction** *function*, **wxObject*** *userData = NULL*)

void Connect(**int** *id*, **int** *lastId*, **wxEventType** *eventType*, **wxObjectEventFunction** *function*, **wxObject*** *userData = NULL*)

Connects the given function dynamically with the event handler, id and event type. This is an alternative to the use of static event tables. See the 'dynamic' sample for usage.

Parameters

id
> The identifier (or first of the identifier range) to be associated with the event handler function.

lastId
> The second part of the identifier range to be associated with the event handler function.

eventType
> The event type to be associated with this event handler.

function
> The event handler function.

userData
> Data to be associated with the event table entry.

Example

```
  frame->Connect( wxID_EXIT,
    wxEVT_COMMAND_MENU_SELECTED,
    (wxObjectEventFunction) (wxEventFunction) (wxCommandEventFunction)
MyFrame::OnQuit );
```

wxEvtHandler::Disconnect

bool Disconnect(**int** *id*, **wxEventType** *eventType = wxEVT_NULL*, **wxObjectEventFunction** *function = NULL*, **wxObject*** *userData = NULL*)

bool Disconnect(**int** *id*, **int** *lastId = -1*, **wxEventType** *eventType = wxEVT_NULL*,

wxObjectEventFunction *function = NULL*, **wxObject*** *userData = NULL*)

Disconnects the given function dynamically from the event handler, using the specified parameters as search criteria and returning TRUE if a matching function has been found and removed. This method can only disconnect functions which have been added using the *wxEvtHandler::Connect* (p. 382) method. There is no way to disconnect functions connected using the (static) event tables.

Parameters

id
    The identifier (or first of the identifier range) associated with the event handler function.

lastId
    The second part of the identifier range associated with the event handler function.

eventType
    The event type associated with this event handler.

function
    The event handler function.

userData
    Data associated with the event table entry.

wxEvtHandler::GetClientData

void* GetClientData()

Gets user-supplied client data.

Remarks

Normally, any extra data the programmer wishes to associate with the object should be made available by deriving a new class with new data members.

See also

wxEvtHandler::SetClientData (p. 386)

wxEvtHandler::GetEvtHandlerEnabled

bool GetEvtHandlerEnabled()

Returns TRUE if the event handler is enabled, FALSE otherwise.

See also

wxEvtHandler::SetEvtHandlerEnabled (p. 386)

wxEvtHandler::GetNextHandler

wxEvtHandler* GetNextHandler()

Gets the pointer to the next handler in the chain.

See also

wxEvtHandler::SetNextHandler (p. 387), *wxEvtHandler::GetPreviousHandler* (p. 384), *wxEvtHandler::SetPreviousHandler* (p. 387), *wxWindow::PushEventHandler* (p. 1224), *wxWindow::PopEventHandler* (p. 1223)

wxEvtHandler::GetPreviousHandler

wxEvtHandler* GetPreviousHandler()

Gets the pointer to the previous handler in the chain.

See also

wxEvtHandler::SetPreviousHandler (p. 387), *wxEvtHandler::GetNextHandler* (p. 384), *wxEvtHandler::SetNextHandler* (p. 387), *wxWindow::PushEventHandler* (p. 1224), *wxWindow::PopEventHandler* (p. 1223)

wxEvtHandler::ProcessEvent

virtual bool ProcessEvent(wxEvent& *event*)

Processes an event, searching event tables and calling zero or more suitable event handler function(s).

Parameters

event
    Event to process.

Return value

TRUE if a suitable event handler function was found and executed, and the function did not call *wxEvent::Skip* (p. 380).

Remarks

Normally, your application would not call this function: it is called in the wxWindows

implementation to dispatch incoming user interface events to the framework (and application).

However, you might need to call it if implementing new functionality (such as a new control) where you define new event types, as opposed to allowing the user to override virtual functions.

An instance where you might actually override the **ProcessEvent** function is where you want to direct event processing to event handlers not normally noticed by wxWindows. For example, in the document/view architecture, documents and views are potential event handlers. When an event reaches a frame, **ProcessEvent** will need to be called on the associated document and view in case event handler functions are associated with these objects. The property classes library (wxProperty) also overrides **ProcessEvent** for similar reasons.

The normal order of event table searching is as follows:

1. If the object is disabled (via a call to *wxEvtHandler::SetEvtHandlerEnabled* (p. 386)) the function skips to step (6).
2. If the object is a wxWindow, **ProcessEvent** is recursively called on the window's *wxValidator* (p. 1172). If this returns TRUE, the function exits.
3. **SearchEventTable** is called for this event handler. If this fails, the base class table is tried, and so on until no more tables exist or an appropriate function was found, in which case the function exits.
4. The search is applied down the entire chain of event handlers (usually the chain has a length of one). If this succeeds, the function exits.
5. If the object is a wxWindow and the event is a wxCommandEvent, **ProcessEvent** is recursively applied to the parent window's event handler. If this returns TRUE, the function exits.
6. Finally, **ProcessEvent** is called on the wxApp object.

See also

wxEvtHandler::SearchEventTable (p. 385)

wxEvtHandler::SearchEventTable

bool SearchEventTable(**wxEventTable&** *table*, **wxEvent&** *event*)

Searches the event table, executing an event handler function if an appropriate one is found.

Parameters

table
  Event table to be searched.

event
  Event to be matched against an event table entry.

Return value

TRUE if a suitable event handler function was found and executed, and the function did not call *wxEvent::Skip* (p. 380).

Remarks

This function looks through the object's event table and tries to find an entry that will match the event.

An entry will match if:

1. The event type matches, and
2. the identifier or identifier range matches, or the event table entry's identifier is zero.

If a suitable function is called but calls *wxEvent::Skip* (p. 380), this function will fail, and searching will continue.

See also

wxEvtHandler::ProcessEvent (p. 384)

wxEvtHandler::SetClientData

void SetClientData(**void*** *data*)

Sets user-supplied client data.

Parameters

data
    Data to be associated with the event handler.

Remarks

Normally, any extra data the programmer wishes to associate with the object should be made available by deriving a new class with new data members.

See also

wxEvtHandler::GetClientData (p. 383)

wxEvtHandler::SetEvtHandlerEnabled

void SetEvtHandlerEnabled(**bool** *enabled*)

Enables or disables the event handler.

Parameters

enabled
	TRUE if the event handler is to be enabled, FALSE if it is to be disabled.

Remarks

You can use this function to avoid having to remove the event handler from the chain, for example when implementing a dialog editor and changing from edit to test mode.

See also

wxEvtHandler::GetEvtHandlerEnabled (p. 383)

wxEvtHandler::SetNextHandler

void SetNextHandler(**wxEvtHandler*** *handler*)

Sets the pointer to the next handler.

Parameters

handler
	Event handler to be set as the next handler.

See also

wxEvtHandler::GetNextHandler (p. 384), *wxEvtHandler::SetPreviousHandler* (p. 387), *wxEvtHandler::GetPreviousHandler* (p. 384), *wxWindow::PushEventHandler* (p. 1224), *wxWindow::PopEventHandler* (p. 1223)

wxEvtHandler::SetPreviousHandler

void SetPreviousHandler(**wxEvtHandler*** *handler*)

Sets the pointer to the previous handler.

Parameters

handler
	Event handler to be set as the previous handler.

See also

wxEvtHandler::GetPreviousHandler (p. 384), *wxEvtHandler::SetNextHandler* (p. 387), *wxEvtHandler::GetNextHandler* (p. 384), *wxWindow::PushEventHandler* (p. 1224), *wxWindow::PopEventHandler* (p. 1223)

wxExpr

The **wxExpr** class is the building brick of expressions similar to Prolog clauses, or objects. It can represent an expression of type long integer, float, string, word, or list, and lists can be nested.

Derived from

None

Include files

<wx/wxexpr.h>

See also

wxExpr overview (p. 1367), *wxExprDatabase* (p. 394)

wxExpr::wxExpr

wxExpr(**const wxString&** *functor*)

Construct a new clause with this form, supplying the functor name. A clause is an object that will appear in the data file, with a list of attribute/value pairs.

wxExpr(**wxExprType** *type*, **const wxString&** *wordOrString = ""*)

Construct a new empty list, or a word (will be output with no quotes), or a string, depending on the value of *type*.

type can be **wxExprList**, **wxExprWord**, or **wxExprString**. If *type* is wxExprList, the value of *wordOrString* will be ignored.

wxExpr(**long** *value*)

Construct an integer expression.

wxExpr(**float** *value*)

Construct a floating point expression.

wxExpr(**wxList*** *value*)

Construct a list expression. The list's nodes' data should themselves be **wxExpr**s.

wxExpr no longer uses the **wxList** internally, so this constructor turns the list into its internal format (assuming a non-nested list) and then deletes the supplied list.

wxExpr::~wxExpr

~wxExpr()

Destructor.

wxExpr::AddAttributeValue

Use these on clauses ONLY. Note that the functions for adding strings and words must be differentiated by function name which is why they are missing from this group (see *wxExpr::AddAttributeValueString* (p. 389) and *wxExpr::AddAttribueValueWord* (p. 390)).

void AddAttributeValue(**const wxString&** *attribute*, **float** *value*)

Adds an attribute and floating point value pair to the clause.

void AddAttributeValue(**const wxString&** *attribute*, **long** *value*)

Adds an attribute and long integer value pair to the clause.

void AddAttributeValue(**const wxString&** *attribute*, **wxList*** *value*)

Adds an attribute and list value pair to the clause, converting the list into internal form and then deleting **value**. Note that the list should not contain nested lists (except if in internal **wxExpr** form.)

void AddAttributeValue(**const wxString&** *attribute*, **wxExpr*** *value*)

Adds an attribute and wxExpr value pair to the clause. Do not delete *value* once this function has been called.

wxExpr::AddAttributeValueString

void AddAttributeValueString(**const wxString&** *attribute*, **const wxString&** *value*)

Adds an attribute and string value pair to the clause.

wxExpr::AddAttributeValueStringList

void AddAttributeValueStringList(**const wxString&** *attribute*, **wxList*** *value*)

Adds an attribute and string list value pair to the clause.

Note that the list passed to this function is a list of strings, NOT a list of **wxExpr**s; it gets turned into a list of **wxExpr**s automatically. This is a convenience function, since lists of strings are often manipulated in C++.

wxExpr::AddAttributeValueWord

void AddAttributeValueWord(**const wxString&** *attribute*, **const wxString&** *value*)

Adds an attribute and word value pair to the clause.

wxExpr::Append

void Append(**wxExpr*** *value*)

Append the **value** to the end of the list. 'this' must be a list.

wxExpr::Arg

wxExpr* Arg(**wxExprType** *type*, **int** *n*) **const**

Get nth arg of the given clause (starting from 1). NULL is returned if the expression is not a clause, or *n* is invalid, or the given type does not match the actual type. See also *wxExpr::Nth* (p. 392).

wxExpr::Insert

void Insert(**wxExpr*** *value*)

Insert the **value** at the start of the list. 'this' must be a list.

wxExpr::GetAttributeValue

These functions are the easiest way to retrieve attribute values, by passing a pointer to variable. If the attribute is present, the variable will be filled with the appropriate value. If not, the existing value is left alone. This style of retrieving attributes makes it easy to set variables to default values before calling these functions; no code is necessary to check whether the attribute is present or not.

bool GetAttributeValue(**const wxString&** *attribute*, **wxString&** *value*) **const**

Retrieve a string (or word) value.

bool GetAttributeValue(**const wxString&** *attribute*, **float&** *value*) **const**

Retrieve a floating point value.

bool GetAttributeValue(**const wxString&** *attribute*, **int&** *value*) **const**

Retrieve an integer value.

bool GetAttributeValue(**const wxString&** *attribute*, **long&** *value*) **const**

Retrieve a long integer value.

bool GetAttributeValue(**const wxString&** *attribute*, **wxExpr**** *value*) **const**

Retrieve a wxExpr pointer.

wxExpr::GetAttributeValueStringList

void GetAttributeValueStringList(**const wxString&***attribute*, **wxList*** *value*) **const**

Use this on clauses ONLY. See above for comments on this style of attribute value retrieval. This function expects to receive a pointer to a new list (created by the calling application); it will append strings to the list if the attribute is present in the clause.

wxExpr::AttributeValue

wxExpr* AttributeValue(**const wxString&** *word*) **const**

Use this on clauses ONLY. Searches the clause for an attribute matching *word*, and returns the value associated with it.

wxExpr::Copy

wxExpr* Copy() **const**

Recursively copies the expression, allocating new storage space.

wxExpr::DeleteAttributeValue

void DeleteAttributeValue(**const wxString&** *attribute*)

Use this on clauses only. Deletes the attribute and its value (if any) from the clause.

wxExpr::Functor

wxString Functor() **const**

Use this on clauses only. Returns the clause's functor (object name).

wxExpr::GetClientData

wxObject* GetClientData() const

Retrieve arbitrary data stored with this clause. This can be useful when reading in data for storing a pointer to the C++ object, so when another clause makes a reference to this clause, its C++ object can be retrieved. See *wxExpr::SetClientData* (p. 393).

wxExpr::GetFirst

wxExpr* GetFirst() const

If this is a list expression (or clause), gets the first element in the list.

See also *wxExpr::GetLast* (p. 392), *wxExpr::GetNext* (p. 392), *wxExpr::Nth* (p. 392).

wxExpr::GetLast

wxExpr* GetLast() const

If this is a list expression (or clause), gets the last element in the list.

See also *wxExpr::GetFirst* (p. 392), *wxExpr::GetNext* (p. 392), *wxExpr::Nth* (p. 392).

wxExpr::GetNext

wxExpr* GetNext() const

If this is a node in a list (any wxExpr may be a node in a list), gets the next element in the list.

See also *wxExpr::GetFirst* (p. 392), *wxExpr::GetLast* (p. 392), *wxExpr::Nth* (p. 392).

wxExpr::IntegerValue

long IntegerValue() const

Returns the integer value of the expression.

wxExpr::Nth

wxExpr* Nth(**int** *n*) **const**

Get nth arg of the given list expression (starting from 0). NULL is returned if the expression is not a list expression, or *n* is invalid. See also *wxExpr::Arg* (p. 390).

Normally, you would use attribute-value pairs to add and retrieve data from objects (clauses) in a data file. However, if the data gets complex, you may need to store attribute values as lists, and pick them apart yourself.

wxExpr::RealValue

float RealValue() **const**

Returns the floating point value of the expression.

wxExpr::SetClientData

void SetClientData(**wxObject** *data)

Associate arbitrary data with this clause. This can be useful when reading in data for storing a pointer to the C++ object, so when another clause makes a reference to this clause, its C++ object can be retrieved. See *wxExpr::GetClientData* (p. 392).

wxExpr::StringValue

wxString StringValue() **const**

Returns the string value of the expression.

wxExpr::Type

wxExprType Type() **const**

Returns the type of the expression. **wxExprType** is defined as follows:

```
typedef enum {
    wxExprNull,
    wxExprInteger,
    wxExprReal,
    wxExprWord,
    wxExprString,
    wxExprList
} wxExprType;
```

wxExpr::WordValue

wxString WordValue() **const**

Returns the word value of the expression.

wxExpr::WriteClause

void WriteClause(**FILE *** *stream*)

Writes the clause to the given stream in Prolog format. Not normally needed, since the whole **wxExprDatabase** will usually be written at once. The format is: functor, open parenthesis, list of comma-separated expressions, close parenthesis, full stop.

wxExpr::WriteExpr

void WriteExpr(**FILE *** *stream*)

Writes the expression (not clause) to the given stream in Prolog format. Not normally needed, since the whole **wxExprDatabase** will usually be written at once. Lists are written in square bracketed, comma-delimited format.

Functions and macros

Below are miscellaneous functions and macros associated with wxExpr objects.

bool wxExprIsFunctor(**wxExpr ****expr*, **const wxString&** *functor*)

Checks that the functor of *expr* is *functor*.

void wxExprCleanUp()

Cleans up the wxExpr system (YACC/LEX buffers) to avoid memory-checking warnings as the program exits.

```
#define wxMakeInteger(x) (new wxExpr((long)x))
#define wxMakeReal(x)    (new wxExpr((float)x))
#define wxMakeString(x)  (new wxExpr(PrologString, x))
#define wxMakeWord(x)    (new wxExpr(PrologWord, x))
#define wxMake(x)        (new wxExpr(x))
```

Macros to help make wxExpr objects.

wxExprDatabase

The **wxExprDatabase** class represents a database, or list, of Prolog-like expressions. Instances of this class are used for reading, writing and creating data files.

Derived from

wxList (p. 619)
wxObject (p. 750)

See also

wxExpr overview (p. 1367), *wxExpr* (p. 388)

wxExprDatabase::wxExprDatabase

void wxExprDatabase(**proioErrorHandler** *handler = 0*)

Construct a new, unhashed database, with an optional error handler. The error handler must be a function returning a bool and taking an integer and a string argument. When an error occurs when reading or writing a database, this function is called. The error is given as the first argument (currently one of WXEXPR_ERROR_GENERAL, WXEXPR_ERROR_SYNTAX) and an error message is given as the second argument. If FALSE is returned by the error handler, processing of the wxExpr operation stops.

Another way of handling errors is simply to call *wxExprDatabase::GetErrorCount* (p. 397) after the operation, to check whether errors have occurred, instead of installing an error handler. If the error count is more than zero, *wxExprDatabase::Write* (p. 398) and *wxExprDatabase::Read* (p. 397) will return FALSE to the application.

For example:

```
bool myErrorHandler(int err, chat *msg)
{
  if (err == WXEXPR_ERROR_SYNTAX)
  {
    wxMessageBox(msg, "Syntax error");
  }
  return FALSE;
}

wxExprDatabase database(myErrorHandler);
```

 wxExprDatabase(**wxExprType** *type*, **const wxString&***attribute*, **int** *size = 500*, **proioErrorHandler** *handler = 0*)

Construct a new database hashed on a combination of the clause functor and a named attribute (often an integer identification).

See above for an explanation of the error handler.

wxExprDatabase::~wxExprDatabase

~wxExprDatabase()

Delete the database and contents.

wxExprDatabase::Append

void Append(**wxExpr*** *clause*)

Append a clause to the end of the database. If the database is hashing, the functor and a user-specified attribute will be hashed upon, giving the option of random access in addition to linear traversal of the database.

wxExprDatabase::BeginFind

void BeginFind()

Reset the current position to the start of the database. Subsequent *wxExprDatabase::FindClause* (p. 396) calls will move the pointer.

wxExprDatabase::ClearDatabase

void ClearDatabase()

Clears the contents of the database.

wxExprDatabase::FindClause

Various ways of retrieving clauses from the database. A return value of NULL indicates no (more) clauses matching the given criteria. Calling the functions repeatedly retrieves more matching clauses, if any.

wxExpr* FindClause(**long** *id*)

Find a clause based on the special "id" attribute.

wxExpr* FindClause(**const wxString&** *attribute*, **const wxString&** *value*)

Find a clause which has the given attribute set to the given string or word value.

wxExpr* FindClause(**const wxString&** *attribute*, **long** *value*)

Find a clause which has the given attribute set to the given integer value.

wxExpr* FindClause(**const wxString&** *attribute*, **float** *value*)

Find a clause which has the given attribute set to the given floating point value.

wxExprDatabase::FindClauseByFunctor

wxExpr* FindClauseByFunctor(**const wxString&** *functor*)

Find the next clause with the specified functor.

wxExprDatabase::GetErrorCount

int GetErrorCount() **const**

Returns the number of errors encountered during the last read or write operation.

wxExprDatabase::HashFind

wxExpr* HashFind(**const wxString&** *functor*, **long** *value*) **const**

Finds the clause with the given functor and with the attribute specified in the database constructor having the given integer value.

For example,

```
// Hash on a combination of functor and integer "id" attribute when
reading in
wxExprDatabase db(wxExprInteger, "id");

// Read it in
db.ReadProlog("data");

// Retrieve a clause with specified functor and id
wxExpr *clause = db.HashFind("node", 24);
```

This would retrieve a clause which is written: `node(id = 24, ..., )`.

wxExpr* HashFind(**const wxString&** *functor*, **const wxString&** *value*)

Finds the clause with the given functor and with the attribute specified in the database constructor having the given string value.

wxExprDatabase::Read

bool Read(**const wxString&** *filename*)

Reads in the given file, returning TRUE if successful.

wxExprDatabase::ReadFromString

bool ReadFromString(**const wxString&** *buffer*)

Reads a Prolog database from the given string buffer, returning TRUE if successful.

wxExprDatabase::Write

bool Write(**FILE ****stream*)

bool Write(**const wxString&** *filename*)

Writes the database as a Prolog-format file.

wxFile

A wxFile performs raw file I/O. This is a very small class designed to minimize the overhead of using it - in fact, there is hardly any overhead at all, but using it brings you automatic error checking and hides differences between platforms and compilers. wxFile also automatically closes the file in its destructor making it unnecessary to worry about forgetting to do it. wxFile is a wrapper around file descriptor. - see also *wxFFile* (p. 404) for a wrapper around FILE structure.

Derived from

None.

Include files

<wx/file.h>

Constants

wx/file.h defines the following constants:

```
#define wxS_IRUSR 00400
#define wxS_IWUSR 00200
#define wxS_IXUSR 00100

#define wxS_IRGRP 00040
#define wxS_IWGRP 00020
#define wxS_IXGRP 00010

#define wxS_IROTH 00004
#define wxS_IWOTH 00002
```

```
#define wxS_IXOTH 00001

// default mode for the new files: corresponds to umask 022
#define wxS_DEFAULT  (wxS_IRUSR | wxS_IWUSR | wxS_IRGRP | wxS_IWGRP |
wxS_IROTH | wxS_IWOTH)
```

These constants define the file access rights and are used with *wxFile::Create* (p. 401) and *wxFile::Open* (p. 402).

The *OpenMode* enumeration defines the different modes for opening a file, it is defined inside wxFile class so its members should be specified with *wxFile::* scope resolution prefix. It is also used with *wxFile::Access* (p. 400) function.

wxFile::read	Open file for reading or test if it can be opened for reading with Access()
wxFile::write	Open file for writing deleting the contents of the file if it already exists or test if it can be opened for writing with Access()
wxFile::read_write	Open file for reading and writing; can not be used with Access()
wxFile::write_append	Open file for appending: the file is opened for writing, but the old contents of the file is not erased and the file pointer is initially placed at the end of the file; can not be used with Access(). This is the same as **wxFile::write** if the file doesn't exist.

Other constants defined elsewhere but used by wxFile functions are wxInvalidOffset which represents an invalid value of type *off_t* and is returned by functions returning *off_t* on error and the seek mode constants used with *Seek()* (p. 403):

wxFromStart	Count offset from the start of the file
wxFromCurrent	Count offset from the current position of the file pointer
wxFromEnd	Count offset from the end of the file (backwards)

wxFile::wxFile

wxFile()

Default constructor.

wxFile(**const char*** *filename*, **wxFile::OpenMode** *mode* = *wxFile::read*)

Opens a file with the given mode. As there is no way to return whether the operation was

successful or not from the constructor you should test the return value of *IsOpened* (p. 402) to check that it didn't fail.

 wxFile(**int** *fd*)

Associates the file with the given file descriptor, which has already been opened.

Parameters

filename
> The filename.

mode
> The mode in which to open the file. May be one of **wxFile::read**, **wxFile::write** and **wxFile::read_write**.

fd
> An existing file descriptor (see *Attach()* (p. 400) for the list of predefined descriptors)

wxFile::~wxFile

 ~wxFile()

Destructor will close the file.

NB: it is not virtual so you should use wxFile polymorphically.

wxFile::Access

static bool Access(**const char** * *name*, **OpenMode** *mode*)

This function verifies if we may access the given file in specified mode. Only values of wxFile::read or wxFile::write really make sense here.

wxFile::Attach

void Attach(**int** *fd*)

Attaches an existing file descriptor to the wxFile object. Example of predefined file descriptors are 0, 1 and 2 which correspond to stdin, stdout and stderr (and have symbolic names of **wxFile::fd_stdin**, **wxFile::fd_stdout** and **wxFile::fd_stderr**).

The descriptor should be already opened and it will be closed by wxFile object.

wxFile::Close

void Close()

Closes the file.

wxFile::Create

bool Create(**const char*** *filename*, **bool** *overwrite* = *FALSE*, **int** *access* = *wxS_DEFAULT*)

Creates a file for writing. If the file already exists, setting **overwrite** to TRUE will ensure it is overwritten.

wxFile::Detach

void Detach()

Get back a file descriptor from wxFile object - the caller is responsible for closing the file if this descriptor is opened. *IsOpened()* (p. 402) will return FALSE after call to Detach().

wxFile::fd

int fd() **const**

Returns the file descriptor associated with the file.

wxFile::Eof

bool Eof() **const**

Returns TRUE if the end of the file has been reached.

Note that the behaviour of the file pointer based class *wxFFile* (p. 404) is different as *wxFFile::Eof* (p. 406) will return TRUE here only if an attempt has been made to read *past* the last byte of the file, while wxFile::Eof() will return TRUE even before such attempt is made if the file pointer is at the last position in the file.

Note also that this function doesn't work on unseekable file descriptors (examples include pipes, terminals and sockets under Unix) and an attempt to use it will result in an error message in such case. So, to read the entire file into memory, you should write a loop which uses *Read* (p. 402) repeatedly and tests its return condition instead of using Eof() as this will not work for special files under Unix.

wxFile::Exists

static bool Exists(**const char*** *filename*)

Returns TRUE if the given name specifies an existing regular file (not a directory or a link)

wxFile::Flush

bool Flush()

Flushes the file descriptor.

Note that wxFile::Flush is not implemented on some Windows compilers due to a missing fsync function, which reduces the usefulness of this function (it can still be called but it will do nothing on unsupported compilers).

wxFile::IsOpened

bool IsOpened() **const**

Returns TRUE if the file has been opened.

wxFile::Length

off_t Length() **const**

Returns the length of the file.

wxFile::Open

bool Open(**const char*** *filename*, **wxFile::OpenMode** *mode = wxFile::read*)

Opens the file, returning TRUE if successful.

Parameters

filename
    The filename.

mode
    The mode in which to open the file. May be one of **wxFile::read**, **wxFile::write** and **wxFile::read_write**.

wxFile::Read

off_t Read(**void*** *buffer*, **off_t** *count*)

Reads the specified number of bytes into a buffer, returning the actual number read.

Parameters

buffer
    A buffer to receive the data.

count
    The number of bytes to read.

Return value

The number of bytes read, or the symbol **wxInvalidOffset** (-1) if there was an error.

wxFile::Seek

off_t Seek(**off_t** *ofs*, **wxSeekMode** *mode = wxFromStart*)

Seeks to the specified position.

Parameters

ofs
    Offset to seek to.

mode
    One of **wxFromStart**, **wxFromEnd**, **wxFromCurrent**.

Return value

The actual offset position achieved, or wxInvalidOffset on failure.

wxFile::SeekEnd

off_t SeekEnd(**off_t** *ofs = 0*)

Moves the file pointer to the specified number of bytes before the end of the file.

Parameters

ofs
    Number of bytes before the end of the file.

Return value

The actual offset position achieved, or wxInvalidOffset on failure.

wxFile::Tell

off_t Tell() const

Returns the current position or wxInvalidOffset if file is not opened or if another error occurred.

wxFile::Write

size_t Write(const void* *buffer*, off_t *count*)

Writes the specified number of bytes from a buffer.

Parameters

buffer
A buffer containing the data.

count
The number of bytes to write.

Return value

the number of bytes actually written

wxFile::Write

bool Write(const wxString& *s*)

Writes the contents of the string to the file, returns TRUE on success.

wxFFile

wxFFile implements buffered file I/O. This is a very small class designed to minimize the overhead of using it - in fact, there is hardly any overhead at all, but using it brings you automatic error checking and hides differences between platforms and compilers. It wraps inside it a `FILE *` handle used by standard C IO library (also known as `stdio`).

Derived from

None.

Include files

<wx/ffile.h>

wxFromStart	Count offset from the start of the file
wxFromCurrent	Count offset from the current position of the file pointer
wxFromEnd	Count offset from the end of the file (backwards)

wxFFile::wxFFile

wxFFile()

Default constructor.

wxFFile(**const char*** *filename*, **const char*** *mode = "r"*)

Opens a file with the given mode. As there is no way to return whether the operation was successful or not from the constructor you should test the return value of *IsOpened* (p. 406) to check that it didn't fail.

wxFFile(**FILE*** *fp*)

Opens a file with the given file pointer, which has already been opened.

Parameters

filename
    The filename.

mode
    The mode in which to open the file using standard C strings.

fp
    An existing file descriptor, such as s tderr.

wxFFile::~wxFFile

~wxFFile()

Destructor will close the file.

NB: it is not virtual so you should *not* derive from wxFFile!

wxFFile::Attach

void Attach(**FILE*** *fp*)

Attaches an existing file pointer to the wxFFile object.

The descriptor should be already opened and it will be closed by wxFFile object.

wxFFile::Close

bool Close()

Closes the file and returns TRUE on success.

wxFFile::Detach

void Detach()

Get back a file pointer from wxFFile object - the caller is responsible for closing the file if this descriptor is opened. *IsOpened()* (p. 406) will return FALSE after call to Detach().

wxFFile::fp

FILE * fp() **const**

Returns the file pointer associated with the file.

wxFFile::Eof

bool Eof() **const**

Returns TRUE if the an attempt has been made to read *past* the end of the file.

Note that the behaviour of the file descriptor based class *wxFile* (p. 398) is different as *wxFile::Eof* (p. 401) will return TRUE here as soon as the last byte of the file has been read.

wxFFile::Flush

bool Flush()

Flushes the file and returns TRUE on success.

wxFFile::IsOpened

bool IsOpened() const

Returns TRUE if the file has been opened.

wxFFile::Length

size_t Length() const

Returns the length of the file.

wxFFile::Open

bool Open(const char* *filename*, const char* *mode* = *"r"*)

Opens the file, returning TRUE if successful.

Parameters

filename
> The filename.

mode
> The mode in which to open the file.

wxFFile::Read

size_t Read(void* *buffer*, off_t *count*)

Reads the specified number of bytes into a buffer, returning the actual number read.

Parameters

buffer
> A buffer to receive the data.

count
> The number of bytes to read.

Return value

The number of bytes read.

wxFFile::Seek

bool Seek(long *ofs*, wxSeekMode *mode* = *wxFromStart*)

Seeks to the specified position and returs TRUE on success.

Parameters

ofs
　　Offset to seek to.

mode
　　One of **wxFromStart**, **wxFromEnd**, **wxFromCurrent**.

wxFFile::SeekEnd

bool SeekEnd(**long** *ofs = 0*)

Moves the file pointer to the specified number of bytes before the end of the file and returns TRUE on success.

Parameters

ofs
　　Number of bytes before the end of the file.

wxFFile::Tell

size_t Tell() **const**

Returns the current position.

wxFFile::Write

size_t Write(**const void*** *buffer*, **size_t** *count*)

Writes the specified number of bytes from a buffer.

Parameters

buffer
　　A buffer containing the data.

count
　　The number of bytes to write.

Return value

Number of bytes written.

wxFFile::Write

bool Write(**const wxString&** *s*)

Writes the contents of the string to the file, returns TRUE on success.

wxFileDataObject

wxFileDataObject is a specialization of *wxDataObject* (p. 197) for file names. The program works with it just as if it were a list of absolute file names, but internally it uses the same format as Explorer and other compatible programs under Windows or GNOME/KDE filemanager under Unix which makes it possible to receive files from them using this class.

Warning: Under all non-Windows platforms this class is currently "input-only", i.e. you can receieve the files from another application, but copying (or dragging) file(s) from a wxWindows application is not currently supported.

Virtual functions to override

None.

Derived from

wxDataObjectSimple (p. 202)
wxDataObject (p. 197)

Include files

<wx/dataobj.h>

See also

wxDataObject (p. 197), *wxDataObjectSimple* (p. 202), *wxTextDataObject* (p. 1088), *wxBitmapDataObject* (p. 75), *wxDataObject* (p. 197)

wxFileDataObject

 wxFileDataObject()

Constructor.

wxFileDataObject::AddFile

virtual void AddFile(const wxString& *file*)

MSW only: adds a file to the file list represented by this data object.

wxFileDataObject::GetFilenames

const wxArrayString& GetFilenames() const

Returns the *array* (p. 44) of file names.

wxFileDialog

This class represents the file chooser dialog.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/filedlg.h>

See also

wxFileDialog overview (p. 1409), *wxFileSelector* (p. 1263)

Remarks

Pops up a file selector box. In Windows, this is the common file selector dialog. In X, this is a file selector box with somewhat less functionality. The path and filename are distinct elements of a full file pathname. If path is "", the current directory will be used. If filename is "", no default filename will be supplied. The wildcard determines what files are displayed in the file selector, and file extension supplies a type extension for the required filename. Flags may be a combination of wxOPEN, wxSAVE, wxOVERWRITE_PROMPT, wxHIDE_READONLY, wxFILE_MUST_EXIST, wxMULTIPLE or 0.

Both the X and Windows versions implement a wildcard filter. Typing a filename containing wildcards (*, ?) in the filename text item, and clicking on Ok, will result in only those files matching the pattern being displayed. The wildcard may be a specification for multiple types of file with a description for each, such as:

```
"BMP files (*.bmp)|*.bmp|GIF files (*.gif)|*.gif"
```

wxFileDialog::wxFileDialog

 wxFileDialog(**wxWindow*** *parent*, **const wxString&** *message = "Choose a file"*, **const wxString&** *defaultDir = ""*, **const wxString&** *defaultFile = ""*, **const wxString&** *wildcard = "*.*"*, **long** *style = 0*, **const wxPoint&** *pos = wxDefaultPosition*)

Constructor. Use *wxFileDialog::ShowModal* (p. 414) to show the dialog.

Parameters

parent
> Parent window.

message
> Message to show on the dialog.

defaultDir
> The default directory, or the empty string.

defaultFile
> The default filename, or the empty string.

wildcard
> A wildcard, such as "*.*" or "BMP files (*.bmp)|*.bmp|GIF files (*.gif)|*.gif".

style
> A dialog style. A bitlist of:

wxOPEN	This is an open dialog.
wxSAVE	This is a save dialog.
wxHIDE_READONLY	Hide read-only files.
wxOVERWRITE_PROMPT	Prompt for a conformation if a file will be overridden.
wxMULTIPLE	For open dialog only: allows selecting multiple files

pos
> Dialog position. Not implemented.

wxFileDialog::~wxFileDialog

 ~wxFileDialog()

Destructor.

wxFileDialog::GetDirectory

wxString GetDirectory() const

Returns the default directory.

wxFileDialog::GetFilename

wxString GetFilename() const

Returns the default filename.

wxFileDialog::GetFilenames

void GetFilenames(wxArrayString& *filenames*) const

Fills the array *filenames* with the names of the files chosen. This function should only be used with the dialogs which have wxMULTIPLE style, use *GetFilename* (p. 412) for the others.

wxFileDialog::GetFilterIndex

int GetFilterIndex() const

Returns the index into the list of filters supplied, optionally, in the wildcard parameter. Before the dialog is shown, this is the index which will be used when the dialog is first displayed. After the dialog is shown, this is the index selected by the user.

wxFileDialog::GetMessage

wxString GetMessage() const

Returns the message that will be displayed on the dialog.

wxFileDialog::GetPath

wxString GetPath() const

Returns the full path (directory and filename) of the selected file.

wxFileDialog::GetPaths

void GetPaths(**wxArrayString&** *paths*) **const**

Fills the array *paths* with the full paths of the files chosen. This function should only be used with the dialogs which have wxMULTIPLE style, use *GetPath* (p. 412) for the others.

wxFileDialog::GetStyle

long GetStyle() **const**

Returns the dialog style.

wxFileDialog::GetWildcard

wxString GetWildcard() **const**

Returns the file dialog wildcard.

wxFileDialog::SetDirectory

void SetDirectory(**const wxString&** *directory*)

Sets the default directory.

wxFileDialog::SetFilename

void SetFilename(**const wxString&** *setfilename*)

Sets the default filename.

wxFileDialog::SetFilterIndex

void SetFilterIndex(**int** *filterIndex*)

Sets the default filter index, starting from zero. Windows only.

wxFileDialog::SetMessage

void SetMessage(**const wxString&** *message*)

Sets the message that will be displayed on the dialog.

wxFileDialog::SetPath

void SetPath(**const wxString&** *path*)

Sets the path (the combined directory and filename that will be returned when the dialog is dismissed).

wxFileDialog::SetStyle

void SetStyle(**long** *style*)

Sets the dialog style. See *wxFileDialog::wxFileDialog* (p. 411) for details.

wxFileDialog::SetWildcard

void SetWildcard(**const wxString&** *wildCard*)

Sets the wildcard, which can contain multiple file types, for example:

"BMP files (*.bmp)|*.bmp|GIF files (*.gif)|*.gif"

wxFileDialog::ShowModal

int ShowModal()

Shows the dialog, returning wxID_OK if the user pressed OK, and wxID_CANCEL otherwise.

wxFileDropTarget

 A drop target which accepts files (dragged from File Manager or Explorer).

Derived from

wxDropTarget (p. 370)

Include files

<wx/dnd.h>

See also

Drag and drop overview (p. 1430), *wxDropSource* (p. 368), *wxDropTarget* (p. 370), *wxTextDropTarget* (p. 1096)

wxFileDropTarget::wxFileDropTarget

wxFileDropTarget()

Constructor.

wxFileDropTarget::OnDrop

virtual bool OnDrop(**long** *x*, **long** *y*, **const void** **data*, **size_t** *size*)

See *wxDropTarget::OnDrop* (p. 372). This function is implemented appropriately for files, and calls *wxFileDropTarget::OnDropFiles* (p. 415).

wxFileDropTarget::OnDropFiles

virtual bool OnDropFiles(**long** *x*, **long** *y*, **size_t** *nFiles*, **const char * const** *files[]*)

Override this function to receive dropped files.

Parameters

x

The x coordinate of the mouse.

y

The y coordinate of the mouse.

nFiles
The number of files being dropped.

files
An array of filenames.

Return value

Return TRUE to accept the data, FALSE to veto the operation.

wxFileHistory

The wxFileHistory encapsulates a user interface convenience, the list of most recently visited files as shown on a menu (usually the File menu).

wxFileHistory can manage one or more file menus. More than one menu may be required in an MDI application, where the file history should appear on each MDI child menu as well as the MDI parent frame.

Derived from

wxObject (p. 750)

Include files

<wx/docview.h>

See also

wxFileHistory overview (p. 1416), *wxDocManager* (p. 334)

wxFileHistory::m_fileHistory

char** m_fileHistory

A character array of strings corresponding to the most recently opened files.

wxFileHistory::m_fileHistoryN

int m_fileHistoryN

The number of files stored in the history array.

wxFileHistory::m_fileMaxFiles

int m_fileMaxFiles

The maximum number of files to be stored and displayed on the menu.

wxFileHistory::m_fileMenu

wxMenu* m_fileMenu

The file menu used to display the file history list (if enabled).

wxFileHistory::wxFileHistory

wxFileHistory(**int** *maxFiles = 9*)

Constructor. Pass the maximum number of files that should be stored and displayed.

wxFileHistory::~wxFileHistory

~wxFileHistory()

Destructor.

wxFileHistory::AddFileToHistory

void AddFileToHistory(**const wxString&** *filename*)

Adds a file to the file history list, if the object has a pointer to an appropriate file menu.

wxFileHistory::AddFilesToMenu

void AddFilesToMenu()

Appends the files in the history list, to all menus managed by the file history object.

void AddFilesToMenu(**wxMenu*** *menu*)

Appends the files in the history list, to the given menu only.

wxFileHistory::GetHistoryFile

wxString GetHistoryFile(**int** *index*) **const**

Returns the file at this index (zero-based).

wxFileHistory::GetMaxFiles

int GetMaxFiles() **const**

Returns the maximum number of files that can be stored.

wxFileHistory::GetNoHistoryFiles

int GetNoHistoryFiles() **const**

Returns the number of files currently stored in the file history.

wxFileHistory::Load

void Load(**wxConfigBase&** *config*)

Loads the file history from the given config object. This function should be called explicitly by the application.

See also

wxConfig (p. 162)

wxFileHistory::RemoveMenu

void RemoveMenu(**wxMenu*** *menu*)

Removes this menu from the list of those managed by this object.

wxFileHistory::Save

void Save(**wxConfigBase&** *config*)

Saves the file history into the given config object. This must be called explicitly by the application.

See also

wxConfig (p. 162)

wxFileHistory::UseMenu

void UseMenu(**wxMenu*** *menu*)

Adds this menu to the list of those managed by this object.

wxFileInputStream

This class represents data read in from a file. There are actually two such groups of classes: this one is based on *wxFile* (p. 398) whereas *wxFFileInputStream* (p. 421) is based in the *wxFFile* (p. 404) class.

Note that *wxFile* (p. 398) and *wxFFile* (p. 404) differ in one aspect, namely when to report that the end of the file has been reached. This is documented in *wxFile::Eof* (p. 401) and *wxFFile::Eof* (p. 406) and the behaviour of the stream classes reflects this difference, i.e. wxFileInputStream will report wxSTREAM_EOF after having read the last byte whereas wxFFileInputStream will report wxSTREAM_EOF after trying to read *past* the last byte.

Derived from

wxInputStream (p. 595)

Include files

<wx/wfstream.h>

See also

wxBufferedInputStream (p. 92), *wxFileOutputStream* (p. 420), *wxFFileOutputStream* (p. 423)

wxFileInputStream::wxFileInputStream

wxFileInputStream(**const wxString&** *ifileName*)

Opens the specified file using its *ifilename* name in read-only mode.

wxFileInputStream(**wxFile&** *file*)

Initializes a file stream in read-only mode using the file I/O object *file*.

wxFileInputStream(**int** *fd*)

Initializes a file stream in read-only mode using the specified file descriptor.

wxFileInputStream::~wxFileInputStream

~wxFileInputStream()

Destructor.

wxFileInputStream::Ok

bool Ok() **const**

Returns TRUE if the stream is initialized and ready.

wxFileOutputStream

This class represents data written to a file. There are actually two such groups of classes: this one is based on *wxFile* (p. 398) whereas *wxFFileInputStream* (p. 421) is based in the *wxFFile* (p. 404) class.

Note that *wxFile* (p. 398) and *wxFFile* (p. 404) differ in one aspect, namely when to report that the end of the file has been reached. This is documented in *wxFile::Eof* (p. 401) and *wxFFile::Eof* (p. 406) and the behaviour of the stream classes reflects this difference, i.e. wxFileInputStream will report wxSTREAM_EOF after having read the last byte whereas wxFFileInputStream will report wxSTREAM_EOF after trying to read *past* the last byte.

Derived from

wxOutputStream (p. 755)

Include files

<wx/wfstream.h>

See also

wxBufferedOutputStream (p. 93), *wxFileInputStream* (p. 418), *wxFFileInputStream* (p. 421)

wxFileOutputStream::wxFileOutputStream

wxFileOutputStream(**const wxString&** *ofileName*)

Creates a new file with *ofilename* name and initializes the stream in write-only mode.

wxFileOutputStream(**wxFile&** *file*)

Initializes a file stream in write-only mode using the file I/O object *file*.

wxFileOutputStream(**int** *fd*)

Initializes a file stream in write-only mode using the file descriptor *fd.*

wxFileOutputStream::~wxFileOutputStream

~wxFileOutputStream()

Destructor.

wxFileOutputStream::Ok

bool Ok() **const**

Returns TRUE if the stream is initialized and ready.

wxFileStream

Derived from

wxFileOutputStream (p. 420), *wxFileInputStream* (p. 418)

Include files

<wx/wfstream.h>

See also

wxStreamBuffer (p. 1005)

wxFileStream::wxFileStream

wxFileStream(**const wxString&** *iofileName*)

Initializes a new file stream in read-write mode using the specified *iofilename* name.

wxFFileInputStream

This class represents data read in from a file. There are actually two such groups of classes: this one is based on *wxFFile* (p. 404) whereas *wxFileInputStream* (p. 418) is based in the *wxFile* (p. 398) class.

Note that *wxFile* (p. 398) and *wxFFile* (p. 404) differ in one aspect, namely when to report that the end of the file has been reached. This is documented in *wxFile::Eof* (p.

401) and *wxFFile::Eof* (p. 406) and the behaviour of the stream classes reflects this difference, i.e. wxFileInputStream will report wxSTREAM_EOF after having read the last byte whereas wxFFileInputStream will report wxSTREAM_EOF after trying to read *past* the last byte.

Derived from

wxInputStream (p. 595)

Include files

<wx/wfstream.h>

See also

wxBufferedInputStream (p. 92), *wxFFileOutputStream* (p. 423), *wxFileOutputStream* (p. 420)

wxFFileInputStream::wxFFileInputStream

wxFFileInputStream(**const wxString&** *ifileName*)

Opens the specified file using its *ifilename* name in read-only mode.

wxFFileInputStream(**wxFFile&** *file*)

Initializes a file stream in read-only mode using the file I/O object *file*.

wxFFileInputStream(**FILE** * *fp*)

Initializes a file stream in read-only mode using the specified file pointer *fp*.

wxFFileInputStream::~wxFFileInputStream

~wxFFileInputStream()

Destructor.

wxFFileInputStream::Ok

bool Ok() **const**

Returns TRUE if the stream is initialized and ready.

wxFFileOutputStream

This class represents data written to a file. There are actually two such groups of classes: this one is based on *wxFFile* (p. 404) whereas *wxFileInputStream* (p. 421) is based in the *wxFile* (p. 398) class.

Note that *wxFile* (p. 398) and *wxFFile* (p. 404) differ in one aspect, namely when to report that the end of the file has been reached. This is documented in *wxFile::Eof* (p. 401) and *wxFFile::Eof* (p. 406) and the behaviour of the stream classes reflects this difference, i.e. wxFileInputStream will report wxSTREAM_EOF after having read the last byte whereas wxFFileInputStream will report wxSTREAM_EOF after trying to read *past* the last byte.

Derived from

wxOutputStream (p. 755)

Include files

<wx/wfstream.h>

See also

wxBufferedOutputStream (p. 93), *wxFFileInputStream* (p. 421), *wxFileInputStream* (p. 418)

wxFFileOutputStream::wxFFileOutputStream

wxFFileOutputStream(**const wxString&** *ofileName*)

Creates a new file with *ofilename* name and initializes the stream in write-only mode.

wxFFileOutputStream(**wxFFile&** *file*)

Initializes a file stream in write-only mode using the file I/O object *file*.

wxFFileOutputStream(**FILE** * *fp*)

Initializes a file stream in write-only mode using the file descriptor *fp*.

wxFFileOutputStream::~wxFFileOutputStream

~wxFFileOutputStream()

Destructor.

wxFFileOutputStream::Ok

bool Ok() **const**

Returns TRUE if the stream is initialized and ready.

wxFFileStream

Derived from

wxFFileOutputStream (p. 423), *wxFFileInputStream* (p. 421)

Include files

<wx/wfstream.h>

See also

wxStreamBuffer (p. 1005)

wxFFileStream::wxFFileStream

wxFFileStream(**const wxString&** *iofileName*)

Initializes a new file stream in read-write mode using the specified *iofilename* name.

wxFilenameListValidator

This class validates a filename for a *property list view* (p. 839), allowing the user to edit it textually and also popping up a file selector in "detailed editing" mode.

See also

Validator classes (p. 1463)

wxFilenameListValidator::wxFilenameListValidator

void wxFilenameListValidator(**wxString** *message = "Select a file"*, **wxString** *wildcard = "*.*"*, **long** *flags=0*)

Constructor. Supply an optional message and wildcard.

wxFileSystem

This class provides an interface for opening files on different file systems. It can handle absolute and/or local filenames. It uses a system of *handlers* (p. 427) to provide access to user-defined virtual file systems.

Derived from

wxObject (p. 750)

Include files

<wx/filesys.h>

See Also

wxFileSystemHandler (p. 427), *wxFSFile* (p. 467), *Overview* (p. 1370)

wxFileSystem::wxFileSystem

 wxFileSystem()

Constructor.

wxFileSystem::AddHandler

static void AddHandler(**wxFileSystemHandler** **handler*)

This static function adds new handler into the list of handlers. The *handlers* (p. 427) provide access to virtual FS.

Note

You can call:

```
wxFileSystem::AddHandler(new My_FS_Handler);
```

This is because (a) AddHandler is a static method, and (b) the handlers are deleted in wxFileSystem's destructor so that you don't have to care about it.

wxFileSystem::ChangePathTo

void ChangePathTo(**const wxString&** *location*, **bool** *is_dir = FALSE*)

Sets the current location. *location* parameter passed to *OpenFile* (p. 427) is relative to this path.

Caution! Unless *is_dir* is TRUE the *location* parameter is not directory name but the name of the file in this directory!! All these commands change path to "dir/subdir/" :

```
ChangePathTo("dir/subdir/xh.htm");
ChangePathTo("dir/subdir", TRUE);
ChangePathTo("dir/subdir/", TRUE);
```

Parameters

location
    the new location. Its meaning depends on value of *is_dir*

is_dir
    if TRUE *location* is new directory. If FALSE (default)*location* is **file in** the new directory.

Example

```
f = fs -> OpenFile("hello.htm"); // opens file 'hello.htm'
fs -> ChangePathTo("subdir/folder", TRUE);
f = fs -> OpenFile("hello.htm"); // opens file
'subdir/folder/hello.htm' !!
```

wxFileSystem::GetPath

wxString GetPath()

Returns actual path (set by *ChangePathTo* (p. 426)).

wxFileSystem::FindFirst

wxString FindFirst(**const wxString&** *wildcard*, **int** *flags = 0*)

Works like *wxFindFirstFile* (p. 1254). Returns name of the first filename (withing filesystem's current path) that matches *wildcard. flags* may be one of wxFILE (only files), wxDIR (only directories) or 0 (both).

wxFileSystem::FindNext

wxString FindNext()

Returns next filename that matches parameters passed to *FindFirst* (p. 426).

wxFileSystem::OpenFile

wxFSFile* OpenFile (**const wxString&** *location*)

Opens file and returns pointer to *wxFSFile* (p. 467) object or NULL if failed. It first tries to open the file in relative scope (based on value passed to ChangePathTo() method) and then as an absolute path.

wxFileSystemHandler

Classes derived from wxFileSystemHandler are used to access virtual file systems. Its public interface consists of two methods: *CanOpen* (p. 428) and *OpenFile* (p. 429). It provides additional protected methods to simplify the process of opening the file: GetProtocol, GetLeftLocation, GetRightLocation, GetAnchor, GetMimeTypeFromExt.

Please have a look at *overview* (p. 1370) if you don't know how locations are constructed.

Also consult *list of available handlers* (p. 1370).

Notes

- The handlers are shared by all instances of wxFileSystem.
- wxHTML library provides handlers for local files and HTTP or FTP protocol
- The *location* parameter passed to OpenFile or CanOpen methods is always an **absolute** path. You don't need to check the FS's current path.

Derived from

wxObject (p. 750)

Include files

<wx/filesys.h>

See also

wxFileSystem (p. 425), *wxFSFile* (p. 467), *Overview* (p. 1370)

wxFileSystemHandler::wxFileSystemHandler

wxFileSystemHandler()

Constructor.

wxFileSystemHandler::CanOpen

virtual bool CanOpen(**const wxString&** *location*)

Returns TRUE if the handler is able to open this file. This function doesn't check whether the file exists or not, it only checks if it knows the protocol. Example:

```
bool MyHand::CanOpen(const wxString& location)
{
    return (GetProtocol(location) == "http");
}
```

Must be overridden in derived handlers.

wxFileSystemHandler::GetAnchor

wxString GetAnchor(**const wxString&** *location*) **const**

Returns the anchor if present in the location. See *wxFSFile* (p. 468) for details.

Example: GetAnchor("index.htm#chapter2") == "chapter2"

Note: the anchor is NOT part of the left location.

wxFileSystemHandler::GetLeftLocation

wxString GetLeftLocation(**const wxString&** *location*) **const**

Returns the left location string extracted from *location*.

Example: GetLeftLocation("file:myzipfile.zip#zip:index.htm") == "file:myzipfile.zip"

wxFileSystemHandler::GetMimeTypeFromExt

wxString GetMimeTypeFromExt(**const wxString&** *location*)

Returns the MIME type based on **extension** of *location*. (While wxFSFile::GetMimeType returns real MIME type - either extension-based or queried from HTTP.)

Example : GetMimeTypeFromExt("index.htm") == "text/html"

wxFileSystemHandler::GetProtocol

wxString GetProtocol(**const wxString&** *location*) **const**

Returns the protocol string extracted from *location*.

Example: GetProtocol("file:myzipfile.zip#zip:index.htm") == "zip"

wxFileSystemHandler::GetRightLocation

wxString GetRightLocation(**const wxString&** *location*) **const**

Returns the right location string extracted from *location*.

Example : GetRightLocation("file:myzipfile.zip#zip:index.htm") == "index.htm"

wxFileSystemHandler::FindFirst

virtual wxString FindFirst(**const wxString&** *wildcard*, **int** *flags = 0*)

Works like *wxFindFirstFile* (p. 1254). Returns name of the first filename (withing filesystem's current path) that matches *wildcard*. *flags* may be one of wxFILE (only files), wxDIR (only directories) or 0 (both).

This method is only called if *CanOpen* (p. 428) returns TRUE.

wxFileSystemHandler::FindNext

virtual wxString FindNext()

Returns next filename that matches parameters passed to *FindFirst* (p. 426).

This method is only called if *CanOpen* (p. 428) returns TRUE and FindFirst returned a non-empty string.

wxFileSystemHandler::OpenFile

virtual wxFSFile* OpenFile(**wxFileSystem&** *fs*, **const wxString&** *location*)

Opens the file and returns wxFSFile pointer or NULL if failed.

Must be overridden in derived handlers.

Parameters

fs

> Parent FS (the FS from that OpenFile was called). See ZIP handler for details of how to use it.

location

> The **absolute** location of file.

wxFileType

This class holds information about a given *file type*. File type is the same as MIME type under Unix, but under Windows it corresponds more to an extension than to MIME type (in fact, several extensions may correspond to a file type). This object may be created in several different ways: the program might know the file extension and wish to find out the corresponding MIME type or, conversely, it might want to find the right extension for the file to which it writes the contents of given MIME type. Depending on how it was created some fields may be unknown so the return value of all the accessors **must** be checked: FALSE will be returned if the corresponding information couldn't be found.

The objects of this class are never created by the application code but are returned by *wxMimeTypesManager::GetFileTypeFromMimeType* (p. 720) and *wxMimeTypesManager::GetFileTypeFromExtension* (p. 719) methods. But it is your responsibility to delete the returned pointer when you're done with it!

A brief reminder about what the MIME types are (see the RFC 1341 for more information): basically, it is just a pair category/type (for example, "text/plain") where the category is a basic indication of what a file is. Examples of categories are "application", "image", "text", "binary", and type is a precise definition of the document format: "plain" in the example above means just ASCII text without any formatting, while "text/html" is the HTML document source.

A MIME type may have one or more associated extensions: "text/plain" will typically correspond to the extension ".txt", but may as well be associated with ".ini" or ".conf".

Derived from

None

Include files

<wx/mimetype.h>

See also

MessageParameters class

One of the most common usages of MIME is to encode an e-mail message. The MIME type of the encoded message is an example of a *message parameter*. These parameters are found in the message headers ("Content-XXX"). At the very least, they must specify the MIME type and the version of MIME used, but almost always they provide additional information about the message such as the original file name or the charset (for the text documents).

These parameters may be useful to the program used to open, edit, view or print the message, so, for example, an e-mail client program will have to pass them to this program. Because wxFileType itself can not know about these parameters, it uses MessageParameters class to query them. The default implementation only requiers the caller to provide the file name (always used by the program to be called - it must know which file to open) and the MIME type and supposes that there are no other parameters. If you wish to supply additional parameters, you must derive your own class from MessageParameters and override GetParamValue() function, for example:

```
// provide the message parameters for the MIME type manager
class MailMessageParameters : public wxFileType::MessageParameters
{
public:
   MailMessageParameters(const wxString& filename,
                         const wxString& mimetype)
      : wxFileType::MessageParameters(filename, mimetype)
   {
   }

   virtual wxString GetParamValue(const wxString& name) const
   {
       // parameter names are not case-sensitive
       if ( name.CmpNoCase("charset") == 0 )
           return "US-ASCII";
       else
           return wxFileType::MessageParameters::GetParamValue(name);
   }
};
```

Now you only need to create an object of this class and pass it to, for example, *GetOpenCommand* (p. 433) like this:

```
wxString command;
if ( filetype->GetOpenCommand(&command,
                              MailMessageParamaters("foo.txt",
"text/plain")) )
{
    // the full command for opening the text documents is in 'command'
```

```
    // (it might be "notepad foo.txt" under Windows or "cat foo.txt"
under Unix)
}
else
{
    // we don't know how to handle such files...
}
```

Windows: As only the file name is used by the program associated with the given extension anyhow (but no other message parameters), there is no need to ever derive from MessageParameters class for a Windows-only program.

wxFileType::wxFileType

wxFileType()

The default constructor is private because you should never create objects of this type: they are only returned by *wxMimeTypesManager* (p. 717) methods.

wxFileType::~wxFileType

~wxFileType()

The destructor of this class is not virtual, so it should not be derived from.

wxFileType::GetMimeType

bool GetMimeType(wxString* *mimeType*)

If the function returns TRUE, the string pointed to by *mimeType* is filled with full MIME type specification for this file type: for example, "text/plain".

wxFileType::GetMimeTypes

bool GetMimeType(wxArrayString& *mimeTypes*)

Same as *GetMimeType* (p. 432) but returns array of MIME types. This array will contain only one item in most cases but sometimes, notably under Unix with KDE, may contain more MIME types. This happens when one file extension is mapped to different MIME types by KDE, mailcap and mime.types.

wxFileType::GetExtensions

bool GetExtensions(wxArrayString& *extensions*)

If the function returns TRUE, the array *extensions* is filled with all extensions associated with this file type: for example, it may contain the following two elements for the MIME type "text/html" (notice the absence of the leading dot): "html" and "htm".

Windows: This function is currently not implemented: there is no (efficient) way to retrieve associated extensions from the given MIME type on this platform, so it will only return TRUE if the wxFileType object was created by *GetFileTypeFromExtension* (p. 719) function in the first place.

wxFileType::GetIcon

bool GetIcon(**wxIcon*** *icon*)

If the function returns TRUE, the icon associated with this file type will be created and assigned to the *icon* parameter.

Unix: MIME manager gathers information about icons from GNOME and KDE settings and thus GetIcon's success depends on availability of these desktop environments.

wxFileType::GetDescription

bool GetDescription(**wxString*** *desc*)

If the function returns TRUE, the string pointed to by *desc* is filled with a brief description for this file type: for example, "text document" for the "text/plain" MIME type.

wxFileType::GetOpenCommand

bool GetOpenCommand(**wxString*** *command*, **MessageParameters&** *params*)

If the function returns TRUE, the string pointed to by *command* is filled with the command which must be executed (see *wxExecute* (p. 1279)) in order to open the file of the given type. The name of the file is retrieved from *MessageParameters* (p. 431) class.

wxFileType::GetPrintCommand

bool GetPrintCommand(**wxString*** *command*,**MessageParameters&** *params*)

If the function returns TRUE, the string pointed to by *command* is filled with the command which must be executed (see *wxExecute* (p. 1279)) in order to print the file of the given type. The name of the file is retrieved from *MessageParameters* (p. 431) class.

wxFileType::ExpandCommand

static wxString ExpandCommand(**const wxString&** *command*,

MessageParameters& *params*)

This function is primarily intended for GetOpenCommand and GetPrintCommand usage but may be also used by the application directly if, for example, you want to use some non default command to open the file.

The function replaces all occurences of

format specificator	with
%s	the full file name
%t	the MIME type
%{param}	the value of the parameter *param*

using the MessageParameters object you pass to it.

If there is no '%s' in the command string (and the string is not empty), it is assumed that the command reads the data on stdin and so the effect is the same as "< %s" were appended to the string.

Unlike all other functions of this class, there is no error return for this function.

wxFlexGridSizer

A flex grid sizer is a sizer which lays out its children in a two-dimensional table with all table fields in one row having the same height and all fields in one column having the same width.

Derived from

wxGridSizer (p. 929)
wxSizer (p. 929)
wxObject (p. 750)

wxFlexGridSizer::wxFlexGridSizer

wxFlexGridSizer(**int** *rows*, **int** *cols*, **int** *vgap*, **int** *hgap*)

wxFlexGridSizer(**int** *cols*, **int** *vgap = 0*, **int** *hgap = 0*)

Constructor for a wxGridSizer. *rows* and *cols* determine the number of columns and rows in the sizer - if either of the parameters is zero, it will be calculated to form the total number of children in the sizer, thus making the sizer grow dynamically. *vgap* and *hgap* define extra space between all children.

wxFilterInputStream

A filter stream has the capability of a normal stream but it can be placed on top of another stream. So, for example, it can uncompress or uncrypt the data which are read from another stream and pass it to the requester.

Derived from

wxInputStream (p. 595)
wxStreamBase (p. 1003)

Include files

<wx/stream.h>

Note

The interface of this class is the same as that of wxInputStream. Only a constructor differs and it is documented below.

wxFilterInputStream::wxFilterInputStream

wxFilterInputStream(**wxInputStream&** *stream*)

Initializes a "filter" stream.

wxFilterOutputStream

A filter stream has the capability of a normal stream but it can be placed on top of another stream. So, for example, it can compress, encrypt the data which are passed to it and write them to another stream.

Derived from

wxOutputStream (p. 755)
wxStreamBase (p. 1003)

Include files

<wx/stream.h>

Note

The use of this class is exactly the same as of wxOutputStream. Only a constructor differs and it is documented below.

wxFilterOutputStream::wxFilterOutputStream

wxFilterOutputStream(**wxOutputStream&** *stream*)

Initializes a "filter" stream.

wxFocusEvent

A focus event is sent when a window's focus changes.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a focus event, use these event handler macros to direct input to a member function that takes a wxFocusEvent argument.

EVT_SET_FOCUS(func)	Process a wxEVT_SET_FOCUS event.
EVT_KILL_FOCUS(func)	Process a wxEVT_KILL_FOCUS event.

See also

wxWindow::OnSetFocus (p. 1221), *wxWindow::OnKillFocus* (p. 1216), *Event handling overview* (p. 1372)

wxFocusEvent::wxFocusEvent

wxFocusEvent(**WXTYPE** *eventType = 0*, **int** *id = 0*)

Constructor.

wxFont

A font is an object which determines the appearance of text. Fonts are used for drawing text to a device context, and setting the appearance of a window's text.

Derived from

wxGDIObject (p. 477)
wxObject (p. 750)

Include files

<wx/font.h>

Predefined objects

Objects:

wxNullFont

Pointers:

wxNORMAL_FONT
wxSMALL_FONT
wxITALIC_FONT
wxSWISS_FONT

See also

wxFont overview (p. 1401), *wxDC::SetFont* (p. 297), *wxDC::DrawText* (p. 289),
wxDC::GetTextExtent (p. 293), *wxFontDialog* (p. 447)

wxFont::wxFont

wxFont()

Default constructor.

 wxFont(**int** *pointSize*, **int** *family*, **int** *style*, **int** *weight*, **const bool** *underline = FALSE*,
const wxString& *faceName = ""*, **wxFontEncoding** *encoding =*
wxFONTENCODING_DEFAULT)

Creates a font object (see *font encoding overview*(p. 1402) for the meaning of the last parameter).

Parameters

pointSize
Size in points.

family
Font family, a generic way of referring to fonts without specifying actual facename. One of:

wxDEFAULT	Chooses a default font.
wxDECORATIVE	A decorative font.
wxROMAN	A formal, serif font.
wxSCRIPT	A handwriting font.
wxSWISS	A sans-serif font.
wxMODERN	A fixed pitch font.

style
One of **wxNORMAL**, **wxSLANT** and **wxITALIC**.

weight
One of **wxNORMAL**, **wxLIGHT** and **wxBOLD**.

underline
The value can be TRUE or FALSE. At present this has an effect on Windows only.

faceName
An optional string specifying the actual typeface to be used. If the empty string, a default typeface will chosen based on the family.

encoding
An encoding which may be one of **wxFONTENCODING_SYSTEM**   Default system encoding.
wxFONTENCODING_DEFAULT   Default application encoding: this is the encoding set by calls to *SetDefaultEncoding* (p. 441) and which may be set to, say, KOI8 to create all fonts by default with KOI8 encoding. Initially, the default application encoding is the same as default system encoding.
wxFONTENCODING_ISO8859_1...15 ISO8859 encodings.
wxFONTENCODING_KOI8 The standard russian encoding for Internet.
wxFONTENCODING_CP1250...1252 Windows encodings similar to ISO8859 (but not identical).
If the specified encoding isn't available, no font is created.

Remarks

If the desired font does not exist, the closest match will be chosen. Under Windows, only scaleable TrueType fonts are used.

Underlining only works under Windows at present.

See also *wxDC::SetFont* (p. 297), *wxDC::DrawText* (p. 289)and *wxDC::GetTextExtent* (p. 293).

wxFont::~wxFont

~wxFont()

Destructor.

Remarks

The destructor may not delete the underlying font object of the native windowing system, since wxFont uses a reference counting system for efficiency.

Although all remaining fonts are deleted when the application exits, the application should try to clean up all fonts itself. This is because wxWindows cannot know if a pointer to the font object is stored in an application data structure, and there is a risk of double deletion.

wxFont::GetDefaultEncoding

static wxFontEncoding GetDefaultEncoding()

Returns the current applications default encoding.

See also

Font encoding overview (p. 1402), *SetDefaultEncoding* (p. 441)

wxFont::GetFaceName

wxString GetFaceName () **const**

Returns the typeface name associated with the font, or the empty string if there is no typeface information.

See also

wxFont::SetFaceName (p. 441)

wxFont::GetFamily

int GetFamily() **const**

Gets the font family. See *wxFont::wxFont* (p. 437) for a list of valid family identifiers.

See also

wxFont::SetFamily (p. 441)

wxFont::GetFontId

int GetFontId() **const**

Returns the font id, if the portable font system is in operation. See *Font overview* (p. 1401) for further details.

wxFont::GetPointSize

int GetPointSize() **const**

Gets the point size.

See also

wxFont::SetPointSize (p. 442)

wxFont::GetStyle

int GetStyle() **const**

Gets the font style. See *wxFont::wxFont* (p. 437) for a list of valid styles.

See also

wxFont::SetStyle (p. 442)

wxFont::GetUnderlined

bool GetUnderlined() **const**

Returns TRUE if the font is underlined, FALSE otherwise.

See also

wxFont::SetUnderlined (p. 443)

wxFont::GetWeight

int GetWeight() const

Gets the font weight. See *wxFont::wxFont* (p. 437) for a list of valid weight identifiers.

See also

wxFont::SetWeight (p. 443)

wxFont::SetDefaultEncoding

static void SetDefaultEncoding(wxFontEncoding *encoding*)

Sets the default font encoding.

See also

Font encoding overview (p. 1402), *GetDefaultEncoding* (p. 439)

wxFont::SetFaceName

void SetFaceName (const wxString& *faceName*)

Sets the facename for the font.

Parameters

faceName
    A valid facename, which should be on the end-user's system.

Remarks

To avoid portability problems, don't rely on a specific face, but specify the font family instead or as well. A suitable font will be found on the end-user's system. If both the family and the facename are specified, wxWindows will first search for the specific face, and then for a font belonging to the same family.

See also

wxFont::GetFaceName (p. 439), *wxFont::SetFamily* (p. 441)

wxFont::SetFamily

void SetFamily(int *family*)

Sets the font family.

Parameters

family
> One of:

wxDEFAULT	Chooses a default font.
wxDECORATIVE	A decorative font.
wxROMAN	A formal, serif font.
wxSCRIPT	A handwriting font.
wxSWISS	A sans-serif font.
wxMODERN	A fixed pitch font.

See also

wxFont::GetFamily (p. 439), *wxFont::SetFaceName* (p. 441)

wxFont::SetPointSize

void SetPointSize(**int** *pointSize*)

Sets the point size.

Parameters

pointSize
> Size in points.

See also

wxFont::GetPointSize (p. 440)

wxFont::SetStyle

void SetStyle(**int** *style*)

Sets the font style.

Parameters

style
> One of **wxNORMAL**, **wxSLANT** and **wxITALIC**.

See also

wxFont::GetStyle (p. 440)

wxFont::SetUnderlined

void SetUnderlined(**const bool** *underlined*)

Sets underlining.

Parameters

underlining
     TRUE to underline, FALSE otherwise.

See also

wxFont::GetUnderlined (p. 440)

wxFont::SetWeight

void SetWeight(**int** *weight*)

Sets the font weight.

Parameters

weight
     One of **wxNORMAL**, **wxLIGHT** and **wxBOLD**.

See also

wxFont::GetWeight (p. 441)

wxFont::operator =

wxFont& operator =(**const wxFont&** *font*)

Assignment operator, using reference counting. Returns a reference to 'this'.

wxFont::operator ==

bool operator ==(**const wxFont&** *font*)

Equality operator. Two fonts are equal if they contain pointers to the same underlying font data. It does not compare each attribute, so two indefontdently-created fonts using the same parameters will fail the test.

wxFont::operator !=

bool operator !=(**const wxFont&** *font*)

Inequality operator. Two fonts are not equal if they contain pointers to different underlying font data. It does not compare each attribute.

wxFontData

wxFontDialog overview (p. 1408)

This class holds a variety of information related to font dialogs.

Derived from

wxObject (p. 750)

Include files

<wx/cmndata.h>

See also

Overview (p. 1408), *wxFontDialog* (p. 447)

wxFontData::wxFontData

 wxFontData()

Constructor. Initializes *fontColour* to black, *showHelp* to black, *allowSymbols* to TRUE, *enableEffects* to TRUE, *minSize* to 0 and *maxSize* to 0.

wxFontData::~wxFontData

 ~wxFontData()

Destructor.

wxFontData::EnableEffects

void EnableEffects(**bool** *enable*)

Enables or disables 'effects' under MS Windows only. This refers to the controls for manipulating colour, strikeout and underline properties.

The default value is TRUE.

wxFontData::GetAllowSymbols

bool GetAllowSymbols()

Under MS Windows, returns a flag determining whether symbol fonts can be selected. Has no effect on other platforms.

The default value is TRUE.

wxFontData::GetColour

wxColour& GetColour()

Gets the colour associated with the font dialog.

The default value is black.

wxFontData::GetChosenFont

wxFont GetChosenFont()

Gets the font chosen by the user. If the user pressed OK (wxFontDialog::Show returned TRUE), this returns a new font which is now 'owned' by the application, and should be deleted if not required. If the user pressed Cancel (wxFontDialog::Show returned FALSE) or the colour dialog has not been invoked yet, this will return NULL.

wxFontData::GetEnableEffects

bool GetEnableEffects()

Determines whether 'effects' are enabled under Windows. This refers to the controls for manipulating colour, strikeout and underline properties.

The default value is TRUE.

wxFontData::GetInitialFont

wxFont GetInitialFont()

Gets the font that will be initially used by the font dialog. This should have previously been set by the application.

wxFontData::GetShowHelp

bool GetShowHelp()

Returns TRUE if the Help button will be shown (Windows only).

The default value is FALSE.

wxFontData::SetAllowSymbols

void SetAllowSymbols(**bool** *allowSymbols*)

Under MS Windows, determines whether symbol fonts can be selected. Has no effect on other platforms.

The default value is TRUE.

wxFontData::SetChosenFont

void SetChosenFont(**const wxFont&** *font*)

Sets the font that will be returned to the user (for internal use only).

wxFontData::SetColour

void SetColour(**const wxColour&** *colour*)

Sets the colour that will be used for the font foreground colour.

The default colour is black.

wxFontData::SetInitialFont

void SetInitialFont(**const wxFont&***font*)

Sets the font that will be initially used by the font dialog.

wxFontData::SetRange

void SetRange(**int** *min*, **int** *max*)

Sets the valid range for the font point size (Windows only).

The default is 0, 0 (unrestricted range).

wxFontData::SetShowHelp

void SetShowHelp(**bool** *showHelp*)

Determines whether the Help button will be displayed in the font dialog (Windows only).

The default value is FALSE.

wxFontData::operator =

void operator =(**const wxFontData&** *data*)

Assingment operator for the font data.

wxFontDialog

This class represents the font chooser dialog.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/fontdlg.h>

See also

Overview (p. 1408), *wxFontData* (p. 444)

wxFontDialog::wxFontDialog

wxFontDialog(**wxWindow*** *parent*, **wxFontData*** *data* = *NULL*)

Constructor. Pass a parent window, and optionally a pointer to a block of font data, which will be copied to the font dialog's font data.

wxFontDialog::~wxFontDialog

~wxFontDialog()

Destructor.

wxFontDialog::GetFontData

wxFontData& GetFontData()

Returns the *font data* (p. 444) associated with the font dialog.

wxFontDialog::ShowModal

int ShowModal()

Shows the dialog, returning wxID_OK if the user pressed Ok, and wxID_CANCEL otherwise.

If the user cancels the dialog (ShowModal returns wxID_CANCEL), no font will be created. If the user presses OK (ShowModal returns wxID_OK), a new wxFont will be created and stored in the font dialog's wxFontData structure.

wxFontEnumerator

wxFontEnumerator enumerates either all available fonts on the system or only the ones with given attributes - either only fixed-width (suited for use in programs such as terminal emulators and the like) or the fonts available in the given *encoding* (p. 1402).

To do this, you just have to call one of EnumerateXXX() functions - either *EnumerateFacenames* (p. 449) or *EnumerateEncodings* (p. 449) and the corresponding callback (*OnFacename* (p. 450) or *OnFontEncoding* (p. 450)) will be called repeatedly until either all fonts satisfying the specified criteria are exhausted or the callback returns FALSE.

Virtual functions to override

Either *OnFacename* (p. 450) or *OnFontEncoding* (p. 450) should be overridden depending on whether you plan to call *EnumerateFacenames* (p. 449) or *EnumerateEncodings* (p. 449). Of course, if you call both of them, you should override both functions.

Derived from

None

Include files

<wx/fontenum.h>

See also

Font encoding overview (p. 1402), *Font sample* (p. 1330), *wxFont* (p. 437), *wxFontMapper* (p. 451)

wxFontEnumerator::EnumerateFacenames

virtual bool EnumerateFacenames(**wxFontEncoding** *encoding* = *wxFONTENCODING_SYSTEM*, **bool** *fixedWidthOnly = FALSE***)**

Call *OnFacename* (p. 450) for each font which supports given encoding (only if it is not wxFONTENCODING_SYSTEM) and is of fixed width (if *fixedWidthOnly* is TRUE).

Calling this function with default arguments will result in enumerating all fonts available on the system.

wxFontEnumerator::EnumerateEncodings

virtual bool EnumerateEncodings(const wxString& *font = ""***)**

Call *OnFontEncoding* (p. 450) for each encoding supported by the given font - or for each encoding supported by at least some font if *font* is not specified.

wxFontEnumerator::GetEncodings

**wxArrayString* GetEncodings(**)

Return array of strings containing all encodings found by *EnumerateEncodings* (p. 449). This is convenience function. It is based on default implementation of *OnFontEncoding* (p. 450) so don't expect it to work if you overwrite that method.

wxFontEnumerator::GetFacenames

**wxArrayString* GetFacenames(**)

Return array of strings containing all facenames found by *EnumerateFacenames* (p. 449). This is convenience function. It is based on default implementation of *OnFacename* (p. 450) so don't expect it to work if you overwrite that method.

wxFontEnumerator::OnFacename

virtual bool OnFacename(**const wxString&** *font*)

Called by *EnumerateFacenames* (p. 449) for each match. Return TRUE to continue enumeration or FALSE to stop it.

wxFontEnumerator::OnFontEncoding

virtual bool OnFontEncoding(**const wxString&** *font*, **const wxString&** *encoding*)

Called by *EnumerateEncodings* (p. 449) for each match. Return TRUE to continue enumeration or FALSE to stop it.

wxFontList

A font list is a list containing all fonts which have been created. There is only one instance of this class: **wxTheFontList**. Use this object to search for a previously created font of the desired type and create it if not already found. In some windowing systems, the font may be a scarce resource, so it is best to reuse old resources if possible. When an application finishes, all fonts will be deleted and their resources freed, eliminating the possibility of 'memory leaks'.

Derived from

wxList (p. 619)
wxObject (p. 750)

Include files

<wx/gdicmn.h>

See also

wxFont (p. 437)

wxFontList::wxFontList

wxFontList()

Constructor. The application should not construct its own font list: use the object pointer **wxTheFontList**.

wxFontList::AddFont

void AddFont(**wxFont ****font*)

Used by wxWindows to add a font to the list, called in the font constructor.

wxFontList::FindOrCreateFont

wxFont * FindOrCreateFont(**int** *point_size*, **int** *family*, **int** *style*, **int** *weight*, **bool** *underline = FALSE*, **const wxString&** *facename = NULL*, **wxFontEncoding** *encoding = wxFONTENCODING_DEFAULT*)

Finds a font of the given specification, or creates one and adds it to the list. See the *wxFont constructor* (p. 437) for details of the arguments.

wxFontList::RemoveFont

void RemoveFont(**wxFont ****font*)

Used by wxWindows to remove a font from the list.

wxFontMapper

wxFontMapper manages user-definable correspondence between logical font names and the fonts present on the machine.

The default implementations of all functions will ask the user if they are not capable of finding the answer themselves and store the answer in a config file (configurable via SetConfigXXX functions). This behaviour may be disabled by giving the value of FALSE to "interactive" parameter.

However, the functions will always consult the config file to allow the user-defined values override the default logic and there is no way to disable this - which shouldn't be ever needed because if "interactive" was never TRUE, the config file is never created anyhow.

In case everything else fails (i.e. there is no record in config file and "interactive" is FALSE or user denied to choose any replacement), the class queries *wxEncodingConverter* (p. 373) for "equivalent" encodings (e.g. iso8859-2 and cp1250)

and tries them.

Global variables

`wxFontMapper *wxTheFontMapper` is defined.

Using wxFontMapper in conjunction with wxEncodingConverter

If you need to display text in encoding which is not available at host system (see *IsEncodingAvailable* (p. 453)), you may use these two classes to a) find font in some similar encoding (see *GetAltForEncoding* (p. 453)) and b) convert the text to this encoding (*wxEncodingConverter::Convert* (p. 375)).

Following code snippet demonstrates it:

```
if (!wxTheFontMapper->IsEncodingAvailable(enc, facename))
{
   wxFontEncoding alternative;
   if (wxTheFontMapper->GetAltForEncoding(enc, &alternative,
                                          facename, FALSE))
   {
       wxEncodingConverter encconv;
       if (!encconv.Init(enc, alternative))
           ...failure...
       else
           text = encconv.Convert(text);
   }
   else
       ...failure (or we may try iso8859-1/7bit ASCII)...
}
...display text...
```

Derived from

No base class

Include files

<wx/fontmap.h>

See also

wxEncodingConverter (p. 373), *Writing non-English applications* (p. 1354)

wxFontMapper::wxFontMapper

wxFontMapper()

Default ctor.

wxFontMapper::~wxFontMapper

~wxFontMapper()

Virtual dtor for a base class.

wxFontMapper::GetAltForEncoding

bool GetAltForEncoding(**wxFontEncoding** *encoding*, **wxNativeEncodingInfo*** *info*, **const wxString&** *facename = wxEmptyString*, **bool** *interactive = TRUE*)

bool GetAltForEncoding(**wxFontEncoding** *encoding*, **wxFontEncoding*** *alt_encoding*, **const wxString&** *facename = wxEmptyString*, **bool** *interactive = TRUE*)

Find an alternative for the given encoding (which is supposed to not be available on this system). If successful, return TRUE and fill info structure with the parameters required to create the font, otherwise return FALSE.

The first form is for wxWindows' internal use while the second one is better suitable for general use -- it returns wxFontEncoding which can consequently be passed to wxFont constructor.

wxFontMapper::IsEncodingAvailable

bool IsEncodingAvailable(**wxFontEncoding** *encoding*, **const wxString&** *facename = wxEmptyString*)

Check whether given encoding is available in given face or not. If no facename is given, find *any* font in this encoding.

wxFontMapper::CharsetToEncoding

wxFontEncoding CharsetToEncoding(**const wxString&** *charset*, **bool** *interactive = TRUE*)

Returns the encoding for the given charset (in the form of RFC 2046) or wxFONTENCODING_SYSTEM if couldn't decode it.

wxFontMapper::GetEncodingName

static wxString GetEncodingName(**wxFontEncoding** *encoding*)

Return internal string identifier for the encoding (see also *GetEncodingDescription()* (p. 454))

wxFontMapper::GetEncodingDescription

static wxString GetEncodingDescription(**wxFontEncoding** *encoding*)

Return user-readable string describing the given encoding.

wxFontMapper::SetDialogParent

void SetDialogParent(**wxWindow*** *parent*)

The parent window for modal dialogs.

wxFontMapper::SetDialogTitle

void SetDialogTitle(**const wxString&** *title*)

The title for the dialogs (note that default is quite reasonable).

wxFontMapper::SetConfig

void SetConfig(**wxConfigBase*** *config*)

Set the config object to use (may be NULL to use default).

By default, the global one (from wxConfigBase::Get() will be used) and the default root path for the config settings is the string returned by GetDefaultConfigPath().

wxFontMapper::SetConfigPath

void SetConfigPath(**const wxString&** *prefix*)

Set the root config path to use (should be an absolute path).

wxFrame

A frame is a window whose size and position can (usually) be changed by the user. It usually has thick borders and a title bar, and can optionally contain a menu bar, toolbar and status bar. A frame can contain any window that is not a frame or dialog.

A frame that has a status bar and toolbar created via the

CreateStatusBar/CreateToolBar functions manages these windows, and adjusts the value returned by GetClientSize to reflect the remaining size available to application windows.

Derived from

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/frame.h>

Window styles

wxDEFAULT_FRAME_STYLE	Defined as **wxMINIMIZE_BOX | wxMAXIMIZE_BOX | wxRESIZE_BOX | wxSYSTEM_MENU | wxCAPTION**.
wxICONIZE	Display the frame iconized (minimized). Windows only.
wxCAPTION	Puts a caption on the frame.
wxMINIMIZE	Identical to **wxICONIZE**. Windows only.
wxMINIMIZE_BOX	Displays a minimize box on the frame.
wxMAXIMIZE	Displays the frame maximized. Windows only.
wxMAXIMIZE_BOX	Displays a maximize box on the frame.
wxSTAY_ON_TOP	Stay on top of other windows. Windows only.
wxSYSTEM_MENU	Displays a system menu.
wxSIMPLE_BORDER	Displays no border or decorations. GTK and Windows only.
wxRESIZE_BORDER	Displays a resizeable border around the window (Unix only).
wxFRAME_FLOAT_ON_PARENT	Causes the frame to be above the parent window in the z-order and not shown in the taskbar. Without this style, frames are created as top-level windows that may be obscured by the parent window, and frame titles are shown in the taskbar. Windows and GTK.
wxFRAME_TOOL_WINDOW	Causes a frame with a small titlebar to be created; the frame title does not appear in the taskbar. Windows only.

The default frame style is for normal, resizeable frames. To create a frame which can not be resized by user, you may use the following combination of styles:
`wxDEFAULT_FRAME_STYLE & | wxRESIZE_BOX | wxMAXIMIZE_BOX).` See also *window styles overview* (p. 1379).

Remarks

An application should normally define an *OnCloseWindow* (p. 1213) handler for the frame to respond to system close events, for example so that related data and subwindows can be cleaned up.

See also

wxMDIParentFrame (p. 675), *wxMDIChildFrame* (p. 670), *wxMiniFrame* (p. 721), *wxDialog* (p. 312)

wxFrame::wxFrame

wxFrame ()

Default constructor.

wxFrame (**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE*, **const wxString&** *name* = *"frame"*)

Constructor, creating the window.

Parameters

parent
　　The window parent. This may be NULL. If it is non-NULL, the frame will always be displayed on top of the parent window on Windows.

id
　　The window identifier. It may take a value of -1 to indicate a default value.

title
　　The caption to be displayed on the frame's title bar.

pos
　　The window position. A value of (-1, -1) indicates a default position, chosen by either the windowing system or wxWindows, depending on platform.

size
　　The window size. A value of (-1, -1) indicates a default size, chosen by either the windowing system or wxWindows, depending on platform.

style
　　The window style. See *wxFrame* (p. 454).

name
　　The name of the window. This parameter is used to associate a name with the item, allowing the application user to set Motif resource values for individual windows.

Remarks

For Motif, MWM (the Motif Window Manager) should be running for any window styles to

work (otherwise all styles take effect).

See also

wxFrame::Create (p. 457)

wxFrame::~wxFrame

void ~wxFrame()

Destructor. Destroys all child windows and menu bar if present.

wxFrame::Centre

void Centre(**int** *direction = wxBOTH*)

Centres the frame on the display.

Parameters

direction
    The parameter may be wxHORIZONTAL, wxVERTICAL or wxBOTH.

wxFrame::Command

void Command(**int** *id*)

Simulate a menu command.

Parameters

id
    The identifier for a menu item.

wxFrame::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxDEFAULT_FRAME_STYLE*, **const wxString&** *name = "frame"*)

Used in two-step frame construction. See *wxFrame::wxFrame* (p. 456) for further details.

wxFrame::CreateStatusBar

virtual wxStatusBar* CreateStatusBar(**int** *number = 1*, **long** *style = 0*, **wxWindowID** *id*

= *-1*, **const wxString&** *name = "statusBar"*)

Creates a status bar at the bottom of the frame.

Parameters

number
> The number of fields to create. Specify a value greater than 1 to create a multi-field status bar.

style
> The status bar style. See *wxStatusBar* (p. 996) for a list of valid styles.

id
> The status bar window identifier. If -1, an identifier will be chosen by wxWindows.

name
> The status bar window name.

Return value

A pointer to the the status bar if it was created successfully, NULL otherwise.

Remarks

The width of the status bar is the whole width of the frame (adjusted automatically when resizing), and the height and text size are chosen by the host windowing system.

By default, the status bar is an instance of wxStatusBar. To use a different class, override *wxFrame::OnCreateStatusBar* (p. 461).

Note that you can put controls and other windows on the status bar if you wish.

See also

wxFrame::SetStatusText (p. 465), *wxFrame::OnCreateStatusBar* (p. 461), *wxFrame::GetStatusBar* (p. 459)

wxFrame::CreateToolBar

virtual wxToolBar* CreateToolBar(**long** *style = wxNO_BORDER |*
wxTB_HORIZONTAL, **wxWindowID** *id = -1*, **const wxString&** *name = "toolBar"*)

Creates a toolbar at the top or left of the frame.

Parameters

style
> The toolbar style. See *wxToolBar* (p. 1123) for a list of valid styles.

id
>The toolbar window identifier. If -1, an identifier will be chosen by wxWindows.

name
>The toolbar window name.

Return value

A pointer to the the toolbar if it was created successfully, NULL otherwise.

Remarks

By default, the toolbar is an instance of wxToolBar (which is defined to be a suitable toolbar class on each platform, such as wxToolBar95). To use a different class, override *wxFrame::OnCreateToolBar* (p. 462).

When a toolbar has been created with this function, or made known to the frame with *wxFrame::SetToolBar* (p. 466), the frame will manage the toolbar position and adjust the return value from *wxWindow::GetClientSize* (p. 1201) to reflect the available space for application windows.

See also

wxFrame::CreateStatusBar (p. 457), *wxFrame::OnCreateToolBar* (p. 462), *wxFrame::SetToolBar* (p. 466), *wxFrame::GetToolBar* (p. 460)

wxFrame::GetClientAreaOrigin

wxPoint GetClientAreaOrigin() const

Returns the origin of the frame client area (in client coordinates). It may be different from (0, 0) if the frame has a toolbar.

wxFrame::GetMenuBar

wxMenuBar* GetMenuBar() const

Returns a pointer to the menubar currently associated with the frame (if any).

See also

wxFrame::SetMenuBar (p. 464), *wxMenuBar* (p. 697), *wxMenu* (p. 687)

wxFrame::GetStatusBar

wxStatusBar* GetStatusBar() const

Returns a pointer to the status bar currently associated with the frame (if any).

See also

wxFrame::CreateStatusBar (p. 457), *wxStatusBar* (p. 996)

wxFrame::GetTitle

wxString GetTitle() const

Gets a string containing the frame title. See *wxFrame::SetTitle* (p. 466).

wxFrame::GetToolBar

wxToolBar* GetToolBar() const

Returns a pointer to the toolbar currently associated with the frame (if any).

See also

wxFrame::CreateToolBar (p. 458), *wxToolBar* (p. 1123), *wxFrame::SetToolBar* (p. 466)

wxFrame::Iconize

void Iconize(bool *iconize*)

Iconizes or restores the frame. Windows only.

Parameters

izonize
    If TRUE, iconizes the frame; if FALSE, shows and restores it.

See also

wxFrame::IsIconized (p. 460), *wxFrame::Maximize* (p. 461).

wxFrame::IsIconized

bool IsIconized() const

Returns TRUE if the frame is iconized. Windows only.

wxFrame::IsMaximized

bool IsMaximized() const

Returns TRUE if the frame is maximized.

wxFrame::Maximize

void Maximize(bool *maximize*)

Maximizes or restores the frame.

Parameters

maximize
    If TRUE, maximizes the frame, otherwise it restores it.

Remarks

This function only works under Windows.

See also

wxFrame::Iconize (p. 460)

wxFrame::OnActivate

void OnActivate(wxActivateEvent& *event*)

Called when a window is activated or deactivated (MS Windows only). See also *wxActivateEvent* (p. 20).

wxFrame::OnCreateStatusBar

virtual wxStatusBar* OnCreateStatusBar(int *number*, long *style*, wxWindowID *id*, const wxString& *name*)

Virtual function called when a status bar is requested by *wxFrame::CreateStatusBar* (p. 457).

Parameters

number
    The number of fields to create.

style
    The window style. See *wxStatusBar* (p. 996) for a list of valid styles.

id

The window identifier. If -1, an identifier will be chosen by wxWindows.

name
    The window name.

Return value

A status bar object.

Remarks

An application can override this function to return a different kind of status bar. The default implementation returns an instance of *wxStatusBar* (p. 996).

See also

wxFrame::CreateStatusBar (p. 457), *wxStatusBar* (p. 996).

wxFrame::OnCreateToolBar

virtual wxToolBar* OnCreateToolBar(**long** *style*, **wxWindowID** *id*, **const wxString&** *name*)

Virtual function called when a toolbar is requested by *wxFrame::CreateToolBar* (p. 458).

Parameters

style
    The toolbar style. See *wxToolBar* (p. 1123) for a list of valid styles.

id
    The toolbar window identifier. If -1, an identifier will be chosen by wxWindows.

name
    The toolbar window name.

Return value

A toolbar object.

Remarks

An application can override this function to return a different kind of toolbar. The default implementation returns an instance of *wxToolBar* (p. 1123).

See also

wxFrame::CreateToolBar (p. 458), *wxToolBar* (p. 1123).

wxFrame::OnMenuCommand

void OnMenuCommand(**wxCommandEvent&** *event*)

See *wxWindow::OnMenuCommand* (p. 1217).

wxFrame::OnMenuHighlight

void OnMenuHighlight(**wxMenuEvent&** *event*)

See *wxWindow::OnMenuHighlight* (p. 1218).

wxFrame::OnSize

void OnSize(**wxSizeEvent&** *event*)

See *wxWindow::OnSize* (p. 1222).

The default **wxFrame::OnSize** implementation looks for a single subwindow, and if one is found, resizes it to fit inside the frame. Override this member if more complex behaviour is required (for example, if there are several subwindows).

wxFrame::SetIcon

void SetIcon(**const wxIcon&** *icon*)

Sets the icon for this frame.

Parameters

icon
    The icon to associate with this frame.

Remarks

The frame takes a 'copy' of *icon*, but since it uses reference counting, the copy is very quick. It is safe to delete *icon* after calling this function.

Under Windows, instead of using **SetIcon**, you can add the following lines to your MS Windows resource file:

```
wxSTD_MDIPARENTFRAME ICON icon1.ico
wxSTD_MDICHILDFRAME  ICON icon2.ico
wxSTD_FRAME          ICON icon3.ico
```

where icon1.ico will be used for the MDI parent frame, icon2.ico will be used for MDI child frames, and icon3.ico will be used for non-MDI frames.

If these icons are not supplied, and **SetIcon** is not called either, then the following defaults apply if you have included wx.rc.

```
wxDEFAULT_FRAME                ICON std.ico
wxDEFAULT_MDIPARENTFRAME       ICON mdi.ico
wxDEFAULT_MDICHILDFRAME        ICON child.ico
```

You can replace std.ico, mdi.ico and child.ico with your own defaults for all your wxWindows application. Currently they show the same icon.

Note: a wxWindows application linked with subsystem equal to 4.0 (i.e. marked as a Windows 95 application) doesn't respond properly to wxFrame::SetIcon. To work around this until a solution is found, mark your program as a 3.5 application. This will also ensure that Windows provides small icons for the application automatically.

See also *wxIcon* (p. 562).

wxFrame::SetMenuBar

void SetMenuBar(**wxMenuBar*** *menuBar*)

Tells the frame to show the given menu bar.

Parameters

menuBar
    The menu bar to associate with the frame.

Remarks

If the frame is destroyed, the menu bar and its menus will be destroyed also, so do not delete the menu bar explicitly (except by resetting the frame's menu bar to another frame or NULL).

Under Windows, a call to *wxFrame::OnSize* (p. 463) is generated, so be sure to initialize data members properly before calling **SetMenuBar**.

Note that it is not possible to call this function twice for the same frame object.

See also

wxFrame::GetMenuBar (p. 459), *wxMenuBar* (p. 697), *wxMenu* (p. 687).

wxFrame::SetStatusBar

void SetStatusBar (**wxStatusBar*** *statusBar*)

Associates a status bar with the frame.

wxFrame::CreateStatusBar (p. 457), *wxStatusBar* (p. 996), *wxFrame::GetStatusBar* (p. 459)

wxFrame::SetStatusText

virtual void SetStatusText(**const wxString&** *text*, **int** *number = 0*)

Sets the status bar text and redraws the status bar.

Parameters

text
　　The text for the status field.

number
　　The status field (starting from zero).

Remarks

Use an empty string to clear the status bar.

See also

wxFrame::CreateStatusBar (p. 457), *wxStatusBar* (p. 996)

wxFrame::SetStatusWidths

virtual void SetStatusWidths(**int** *n*, **int** *widths)

Sets the widths of the fields in the status bar.

Parameters

nThe number of fields in the status bar. It must be the same used in *CreateStatusBar* (p. 457).

widths
　　Must contain an array of *n* integers, each of which is a status field width in pixels. A value of -1 indicates that the field is variable width; at least one field must be -1. You should delete this array after calling **SetStatusWidths**.

Remarks

The widths of the variable fields are calculated from the total width of all fields, minus the sum of widths of the non-variable fields, divided by the number of variable fields.

wxPython note: Only a single parameter is required, a Python list of integers.

wxFrame::SetToolBar

void SetToolBar(**wxToolBar*** *toolBar*)

Associates a toolbar with the frame.

See also

wxFrame::CreateToolBar (p. 458), *wxToolBar* (p. 1123), *wxFrame::GetToolBar* (p. 460)

wxFrame::SetTitle

virtual void SetTitle (**const wxString&** *title*)

Sets the frame title.

Parameters

title
     The frame title.

See also

wxFrame::GetTitle (p. 460)

wxFrame::ShowFullScreen

bool ShowFullScreen(**bool** *show*, **long** *style = wxFULLSCREEN_ALL*)

Passing TRUE to *shows* shows the frame full-screen, and passing FALSE restores the frame again. *style* is a bit list containing some or all of the following values, which indicate what elements of the frame to hide in full-screen mode:

- wxFULLSCREEN_NOMENUBAR
- wxFULLSCREEN_NOTOOLBAR
- wxFULLSCREEN_NOSTATUSBAR
- wxFULLSCREEN_NOBORDER
- wxFULLSCREEN_NOCAPTION
- wxFULLSCREEN_ALL (all of the above)

This function only works on Windows and has not been tested with MDI frames.

wxFSFile

This class represents a single file opened by *wxFileSystem* (p. 425). It provides more information than wxWindow's input stream (stream, filename, mime type, anchor).

Note: Any pointer returned by wxFSFile's member is valid only as long as wxFSFile object exists. For example a call to GetStream() doesn't *create* the stream but only returns the pointer to it. In other words after 10 calls to GetStream() you will obtain ten identical pointers.

Derived from

wxObject (p. 750)

Include files

<wx/filesys.h>

See Also

wxFileSystemHandler (p. 427), *wxFileSystem* (p. 425), *Overview* (p. 1370)

wxFSFile::wxFSFile

 wxFSFile(**wxInputStream** **stream*, **const wxString&** *loc*, **const wxString&** *mimetype*, **const wxString&** *anchor*)

Constructor. You probably won't use it. See Notes for details.

Parameters

stream
    The input stream that will be used to access data

location
    The full location (aka filename) of the file

mimetype
    MIME type of this file. Mime type is either extension-based or HTTP Content-Type

anchor
    Anchor. See *GetAnchor()* (p. 468) for details.

If you are not sure of the meaning of these params, see the description of the GetXXXX() functions.

Notes

It is seldom used by the application programmer but you will need it if you are writing your own virtual FS. For example you may need something similar to wxMemoryInputStream, but because wxMemoryInputStream doesn't free the memory when destroyed and thus passing a memory stream pointer into wxFSFile constructor would lead to memory leaks, you can write your own class derived from wxFSFile:

```
class wxMyFSFile : public wxFSFile
{
    private:
        void *m_Mem;
    public:
        wxMyFSFile(.....)
      ~wxMyFSFile() {free(m_Mem);}
          // of course dtor is virtual ;-)
};
```

wxFSFile::GetAnchor

const wxString& GetAnchor() const

Returns anchor (if present). The term of **anchor** can be easily explained using few examples:

```
index.htm#anchor                     /* 'anchor' is anchor */
index/wx001.htm                      /* NO anchor here!    */
archive/main.zip#zip:index.htm#global /* 'global'          */
archive/main.zip#zip:index.htm       /* NO anchor here!    */
```

Usually an anchor is presented only if the MIME type is 'text/html'. But it may have some meaning with other files; for example myanim.avi#200 may refer to position in animation or reality.wrl#MyView may refer to a predefined view in VRML.

wxFSFile::GetLocation

const wxString& GetLocation() const

Returns full location of the file, including path and protocol. Examples :

```
http://www.wxwindows.org
http://www.ms.mff.cuni.cz/~vsla8348/wxhtml/archive.zip#zip:info.txt
file:/home/vasek/index.htm
relative-file.htm
```

wxFSFile::GetMimeType

const wxString& GetMimeType() const

Returns the MIME type of the content of this file. It is either extension-based (see wxMimeTypesManager) or extracted from HTTP protocol Content-Type header.

wxFSFile::GetModificationTime

wxDateTime GetModificationTime() const

Returns time when this file was modified.

wxFSFile::GetStream

wxInputStream* GetStream() const

Returns pointer to the stream. You can use the returned stream to directly access data. You may suppose that the stream provide Seek and GetSize functionality (even in the case of the HTTP protocol which doesn't provide this by default. wxHtml uses local cache to work around this and to speed up the connection).

wxFTP

Derived from

wxProtocol (p. 853)

Include files

<wx/protocol/ftp.h>

See also

wxSocketBase (p. 943)

wxFTP::SendCommand

bool SendCommand(const wxString& *command*, char *ret*)

Send the specified *command* to the FTP server. *ret* specifies the expected result.

Return value

TRUE if the command has been sent successfully, else FALSE.

wxFTP::GetLastResult

const wxString& GetLastResult()

Returns the last command result.

wxFTP::ChDir

bool ChDir(**const wxString&** *dir*)

Change the current FTP working directory. Returns TRUE if successful.

wxFTP::MkDir

bool MkDir(**const wxString&** *dir*)

Create the specified directory in the current FTP working directory. Returns TRUE if successful.

wxFTP::RmDir

bool RmDir(**const wxString&** *dir*)

Remove the specified directory from the current FTP working directory. Returns TRUE if successful.

wxFTP::Pwd

wxString Pwd()

Returns the current FTP working directory.

wxFTP::Rename

bool Rename(**const wxString&** *src*, **const wxString&** *dst*)

Rename the specified *src* element to *dst*. Returns TRUE if successful.

wxFTP::RmFile

bool RmFile(**const wxString&** *path*)

Delete the file specified by *path*. Returns TRUE if successful.

wxFTP::SetUser

void SetUser(**const wxString&** *user*)

Sets the user name to be sent to the FTP server to be allowed to log in.

Default value

The default value of the user name is "anonymous".

Remark

This parameter can be included in a URL if you want to use the URL manager. For example, you can use: "ftp://a_user:a_password@a.host:service/a_directory/a_file" to specify a user and a password.

wxFTP::SetPassword

void SetPassword(**const wxString&** *passwd*)

Sets the password to be sent to the FTP server to be allowed to log in.

Default value

The default value of the user name is your email address. For example, it could be "username@userhost.domain". This password is built by getting the current user name and the host name of the local machine from the system.

Remark

This parameter can be included in a URL if you want to use the URL manager. For example, you can use: "ftp://a_user:a_password@a.host:service/a_directory/a_file" to specify a user and a password.

wxFTP::GetList

bool GetList(**wxArrayString&** *files*, **const wxString&** *wildcard* = *""*)

The GetList function is quite low-level. It returns the list of the files in the current directory. The list can be filtered using the *wildcard* string. If *wildcard* is empty (default), it will return all files in directory.

The form of the list can change from one peer system to another. For example, for a UNIX peer system, it will look like this:

```
-r--r--r--   1 guilhem  lavaux        12738 Jan 16 20:17 cmndata.cpp
-r--r--r--   1 guilhem  lavaux        10866 Jan 24 16:41 config.cpp
-rw-rw-rw-   1 guilhem  lavaux        29967 Dec 21 19:17 cwlex_yy.c
-rw-rw-rw-   1 guilhem  lavaux        14342 Jan 22 19:51 cwy_tab.c
-r--r--r--   1 guilhem  lavaux        13890 Jan 29 19:18 date.cpp
-r--r--r--   1 guilhem  lavaux         3989 Feb  8 19:18 datstrm.cpp
```

But on Windows system, it will look like this:

```
winamp~1 exe    520196 02-25-1999  19:28  winamp204.exe
        1 file(s)           520 196 bytes
```

Return value: TRUE if the file list was successfully retrieved, FALSE otherwise.

wxFTP::GetOutputStream

wxOutputStream * GetOutputStream(**const wxString&** *file*)

Initializes an output stream to the specified *file*. The returned stream has all but the seek functionality of wxStreams. When the user finishes writing data, he has to delete the stream to close it.

Return value

An initialized write-only stream.

See also

wxOutputStream (p. 755)

wxFTP::GetInputStream

wxInputStream * GetInputStream(**const wxString&** *path*)

Creates a new input stream on the the specified path. You can use all but the seek functionality of wxStream. Seek isn't available on all streams. For example, http or ftp streams do not deal with it. Other functions like Tell are not available for this sort of stream, at present. You will be notified when the EOF is reached by an error.

Return value

Returns NULL if an error occurred (it could be a network failure or the fact that the file doesn't exist).

Returns the initialized stream. You will have to delete it yourself when you don't need it anymore. The destructor closes the DATA stream connection but will leave the COMMAND stream connection opened. It means that you can still send new commands without reconnecting.

Example of a standalone connection (without wxURL)

```
wxFTP ftp;
wxInputStream *in_stream;
char *data;

ftp.Connect("a.host.domain");
ftp.ChDir("a_directory");
in_stream = ftp.GetInputStream("a_file_to_get");

data = new char[in_stream->StreamSize()];

in_stream->Read(data, in_stream->StreamSize());
if (in_stream->LastError() != wxStream_NOERROR) {
  // Do something.
}

delete in_stream; /* Close the DATA connection */

ftp.Close(); /* Close the COMMAND connection */
```

See also

wxInputStream (p. 595)

wxGauge

A gauge is a horizontal or vertical bar which shows a quantity (often time). There are no user commands for the gauge.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/gauge.h>

Window styles

wxGA_HORIZONTAL	Creates a horizontal gauge.
wxGA_VERTICAL	Creates a vertical gauge.
wxGA_PROGRESSBAR	Under Windows 95, creates a horizontal progress bar.
wxGA_SMOOTH	Under Windows 95, creates smooth progress bar with one pixel wide update step.

See also *window styles overview* (p. 1379).

Event handling

wxGauge is read-only so generates no events.

See also

wxSlider (p. 934), *wxScrollBar* (p. 907)

wxGauge::wxGauge

wxGauge()

Default constructor.

wxGauge(**wxWindow*** *parent*, **wxWindowID** *id*, **int** *range*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxGA_HORIZONTAL*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"gauge"*)

Constructor, creating and showing a gauge.

Parameters

parent
    Window parent.

id
    Window identifier.

range
    Integer range (maximum value) of the gauge.

pos
    Window position.

size
    Window size.

style
    Gauge style. See *wxGauge* (p. 473).

name
    Window name.

Remarks

Under Windows 95, there are two different styles of gauge: normal gauge, and progress bar (when the **wxGA_PROGRESSBAR** style is used). A progress bar is always horizontal.

See also

wxGauge::Create (p. 475)

wxGauge::~wxGauge

~wxGauge()

Destructor, destroying the gauge.

wxGauge::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **int** *range*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxGA_HORIZONTAL*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"gauge"*)

Creates the gauge for two-step construction. See *wxGauge::wxGauge* (p. 474) for further details.

wxGauge::GetBezelFace

int GetBezelFace() **const**

Returns the width of the 3D bezel face.

Remarks

Windows only, not for **wxGA_PROGRESSBAR** .

See also

wxGauge::SetBezelFace (p. 476)

wxGauge::GetRange

int GetRange() **const**

Returns the maximum position of the gauge.

See also

wxGauge::SetRange (p. 476)

wxGauge::GetShadowWidth

int GetShadowWidth() const

Returns the 3D shadow margin width.

Remarks

Windows only, not for **wxGA_PROGRESSBAR**.

See also

wxGauge::SetShadowWidth (p. 477)

wxGauge::GetValue

int GetValue() const

Returns the current position of the gauge.

See also

wxGauge::SetValue (p. 477)

wxGauge::SetBezelFace

void SetBezelFace(**int** *width*)

Sets the 3D bezel face width.

Remarks

Windows only, not for **wxGA_PROGRESSBAR**.

See also

wxGauge::GetBezelFace (p. 475)

wxGauge::SetRange

void SetRange(**int** *range*)

Sets the range (maximum value) of the gauge.

See also

wxGauge::GetRange (p. 475)

wxGauge::SetShadowWidth

void SetShadowWidth(**int** *width*)

Sets the 3D shadow width.

Remarks

Windows only, not for **wxGA_PROGRESSBAR** .

wxGauge::SetValue

void SetValue(**int** *pos*)

Sets the position of the gauge.

Parameters

pos
Position for the gauge level.

See also

wxGauge::GetValue (p. 476)

wxGDIObject

This class allows platforms to implement functionality to optimise GDI objects, such as wxPen, wxBrush and wxFont. On Windows, the underling GDI objects are a scarce resource and are cleaned up when a usage count goes to zero. On some platforms this class may not have any special functionality.

Since the functionality of this class is platform-specific, it is not documented here in detail.

Derived from

wxObject (p. 750)

Include files

<wx/gdiobj.h>

See also

wxPen (p. 775), *wxBrush* (p. 80), *wxFont* (p. 437)

wxGDIObject::wxGDIObject

 wxGDIObject()

Default constructor.

wxGLCanvas

wxGLCanvas is a class for displaying OpenGL graphics. There are wrappers for
OpenGL on Windows, and GTK+ and Motif.

To use this class, create a wxGLCanvas window, call *wxGLCanvas::SetCurrent* (p. 479)
to direct normal OpenGL commands to the window, and then call
wxGLCanvas::SwapBuffers (p. 479) to show the OpenGL buffer on the window.

Please note that despite deriving from wxScrolledWindow, scrolling is not enabled for
this class under Windows.

To switch wxGLCanvas support on under Windows, edit setup.h and set
wxUSE_GLCANVAS to 1. On Unix, pass --with-opengl to configure to compile using
OpenGL or Mesa.

Derived from

wxScrolledWindow (p. 916)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/glcanvas.h>

Window styles

There are no specific window styles for this class.

See also *window styles overview* (p. 1379).

wxGLCanvas::wxGLCanvas

void wxGLCanvas(**wxWindow*** *parent*, **wxWindowID** *id = -1*, **const wxPoint&** *pos*, **const wxSize&** *size*, **long** *style=0*, **const wxString&** *name="GLCanvas"*, **int*** *attribList = 0*, **const wxPalette&** *palette = wxNullPalette*)

void wxGLCanvas(**wxWindow*** *parent*, **wxGLCanvas*** *sharedCanvas = NULL*, **wxWindowID** *id = -1*, **const wxPoint&** *pos*, **const wxSize&** *size*, **long** *style=0*, **const wxString&** *name="GLCanvas"*, **int*** *attribList = 0*, **const wxPalette&** *palette = wxNullPalette*)

void wxGLCanvas(**wxWindow*** *parent*, **wxGLContext*** *sharedContext = NULL*, **wxWindowID** *id = -1*, **const wxPoint&** *pos*, **const wxSize&** *size*, **long** *style=0*, **const wxString&** *name="GLCanvas"*, **int*** *attribList = 0*, **const wxPalette&** *palette = wxNullPalette*)

Constructor.

wxGLCanvas::SetCurrent

void SetCurrent()

Sets this canvas as the current recipient of OpenGL calls.

wxGLCanvas::SetColour

void SetColour(**const char*** *colour*)

Sets the current colour for this window, using the wxWindows colour database to find a named colour.

wxGLCanvas::SwapBuffers

void SwapBuffers()

Displays the previous OpenGL commands on the window.

wxGenericValidator

wxGenericValidator performs data transfer (but not validation or filtering) for the following basic controls: wxButton, wxCheckBox, wxListBox, wxStaticText, wxRadioButton, wxRadioBox, wxChoice, wxComboBox, wxGauge, wxSlider, wxScrollBar, wxSpinButton, wxTextCtrl, wxCheckListBox.

It checks the type of the window and uses an appropriate type for that window. For example, wxButton and wxTextCtrl transfer data to and from a wxString variable; wxListBox uses a wxArrayInt; wxCheckBox uses a bool.

For more information, please see *Validator overview* (p. 1382).

Derived from

wxValidator (p. 1172)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/valgen.h>

See also

Validator overview (p. 1382), *wxValidator* (p. 1172), *wxTextValidator* (p. 1097)

wxGenericValidator::wxGenericValidator

wxGenericValidator(**const wxGenericValidator&** *validator*)

Copy constructor.

wxGenericValidator(**bool*** *valPtr*)

Constructor taking a bool pointer. This will be used for wxCheckBox and wxRadioButton.

wxGenericValidator(**wxString*** *valPtr*)

Constructor taking a wxString pointer. This will be used for wxButton, wxComboBox, wxStaticText, wxTextCtrl.

wxGenericValidator(**int*** *valPtr*)

Constructor taking an integer pointer. This will be used for wxGauge, wxScrollBar, wxRadioBox, wxSpinButton, wxChoice.

wxGenericValidator(**wxArrayInt*** *valPtr*)

Constructor taking a wxArrayInt pointer. This will be used for wxListBox, wxCheckListBox.

Parameters

validator
> Validator to copy.

valPtr
> A pointer to a variable that contains the value. This variable should have a lifetime equal to or longer than the validator lifetime (which is usually determined by the lifetime of the window).

wxGenericValidator::~wxGenericValidator

~wxGenericValidator()

Destructor.

wxGenericValidator::Clone

virtual wxValidator* Clone() **const**

Clones the generic validator using the copy constructor.

wxGenericValidator::TransferFromWindow

virtual bool TransferToWindow()

Transfers the value to the window.

wxGenericValidator::TransferToWindow

virtual bool TransferToWindow()

Transfers the window value to the appropriate data type.

wxGrid

wxGrid is a class for displaying and editing tabular information.

Note: there is a new grid implementation from wxWindows 2.1.14, with an API that is

backwardly compatible with the one documented here. This documentation is awaiting updates for the new and improved API.

Derived from

wxPanel (p. 769)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/grid.h>

Window styles

There are no specific window styles for this class, but you may use different SetXXX() functions to change the controls behaviour (for example, to enable in-place editing).

See also *window styles overview* (p. 1379).

See also

wxGrid classes overview (p. 1427)

wxGrid::wxGrid

void wxGrid(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos*, **const wxSize&** *size*, **long** *style=0*, **const wxString&** *name="grid"*)

Constructor. Before using a wxGrid object, you must call CreateGrid to set up the required rows and columns.

wxGrid::AdjustScrollbars

void AdjustScrollbars()

Call this function whenever a change has been made via the API that might alter the scrollbar characteristics: particularly when adding or deleting rows, or changing row or column dimensions. For example, removing rows might make it unnecessary to show the vertical scrollbar.

wxGrid::AppendCols

bool AppendCols(**int** *n=1*, **bool** *updateLabels=TRUE*)

Appends *n* columns to the grid. If *updateLabels* is TRUE, the function OnChangeLabels is called to give the application the opportunity to relabel.

wxGrid::AppendRows

bool AppendRows(**int** *n=1*, **bool** *updateLabels=TRUE*)

Appends *n* rows to the grid. If *updateLabels* is TRUE, the function OnChangeLabels is called to give the application the opportunity to relabel.

wxGrid::BeginBatch

void BeginBatch()

Start a BeginBatch/EndBatch pair between which, calls to SetCellValue or SetCellBitmap will not cause a refresh. This allows you to speed up some operations (for example, setting several hundred cell values). You can nest, but not overlap, these two functions.

See also *wxGrid::EndBatch* (p. 484), *wxGrid::GetBatchCount* (p. 484).

wxGrid::CellHitTest

bool CellHitTest(**int** *x*, **int** *y*, **int** *row, **int** *col)

Returns TRUE if the x, y panel position coincides with a cell. If so, *row* and *col* are returned.

wxGrid::CreateGrid

bool CreateGrid(**int** *rows*, **int** *cols*, **wxString** ***cellValues=NULL*, **short** **widths=NULL*, **short** *defaultWidth=wxGRID_DEFAULT_CELL_WIDTH*, **short** *defaultHeight=wxGRID_DEFAULT_CELL_HEIGHT*)

Creates a grid *rows* high and *cols* wide. You can optionally specify an array of initial values and widths, and/or default cell width and height.

Call this function after creating the wxGrid object.

wxPython note: Currently the `cellValues` and `widths` parameters don't exisit in the wxPython version of this method. So in other words, the definition of the wxPython version of this method looks like this:
```
CreateGrid(rows, cols,
          defaultWidth = wxGRID_DEFAULT_CELL_WIDTH,
          defaultHeight = wxGRID_DEFAULT_CELL_HEIGHT)
```

wxGrid::CurrentCellVisible

bool CurrentCellVisible()

Returns TRUE if the currently selected cell is visible, FALSE otherwise.

wxGrid::DeleteCols

bool DeleteCols(**int** *pos=0,* **int** *n=1,* **bool** *updateLabels=TRUE*)

Deletes *n* columns from the grid at position *pos*. If *updateLabels* is TRUE, the function OnChangeLabels is called to give the application the opportunity to relabel.

wxGrid::DeleteRows

bool DeleteRows(**int** *pos=0,* **int** *n=1,* **bool** *updateLabels=TRUE*)

Deletes *n* rows from the grid at position *pos*. If *updateLabels* is TRUE, the function OnChangeLabels is called to give the application the opportunity to relabel.

wxGrid::EndBatch

void EndBatch()

End a BeginBatch/EndBatch pair between which, calls to SetCellValue or SetCellBitmap will not cause a refresh. This allows you to speed up some operations (for example, setting several hundred cell values). You can nest, but not overlap, these two functions.

See also *wxGrid::BeginBatch* (p. 483), *wxGrid::GetBatchCount* (p. 484).

wxGrid::GetBatchCount

int GetBatchCount() **const**

Return the level of batch nesting. This is initially zero, and will be incremented every time BeginBatch is called, and decremented when EndBatch is called. When the batch count is more zero, some functions (such as SetCellValue and SetCellBitmap) will not refresh the cell.

See also *wxGrid::BeginBatch* (p. 483), *wxGrid::EndBatch* (p. 484).

wxGrid::GetCell

wxGridCell * GetCell(**int** *row,* **int** *col*) **const**

Returns the grid cell object associated with this position.

wxGenericGrid implementation only.

wxGrid::GetCellAlignment

int GetCellAlignment(**int** *row,* **int** *col*) **const**

int GetCellAlignment() **const**

Sets the text alignment for the cell at the given position, or the global alignment value. The return value is wxLEFT, wxRIGHT or wxCENTRE.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **GetCellAlignment(row, col)**
> **GetDefCellAlignment()**

wxGrid::GetCellBackgroundColour

wxColour& GetCellBackgroundColour(**int** *row,* **int** *col*) **const**

wxColour& GetCellBackgroundColour() **const**

Gets the background colour for the cell at the given position, or the global background colour.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **GetCellBackgroundColour(row, col)**
> **GetDefCellBackgroundColourt()**

wxGrid::GetCells

wxGridCell *** GetCells() **const**

Returns the array of grid cell object associated with this wxGrid.

wxGrid::GetCellTextColour

wxColour& GetCellTextColour(**int** *row*, **int** *col*) **const**

wxColour& GetCellTextColour() **const**

Gets the text colour for the cell at the given position, or the global text colour.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **GetCellTextColour(row, col)**
> **GetDefCellTextColour()**

wxGrid::GetCellTextFont

const wxFont& GetCellTextFont(**int** *row*, **int** *col*) **const**

wxFont& GetCellTextFont() **const**

Gets the text font for the cell at the given position, or the global text font.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **GetCellTextFont(row, col)**
> **GetDefCellTextFont()**

wxGrid::GetCellValue

wxString& GetCellValue(**int** *row*, **int** *col*) **const**

Returns the cell value at the given position.

wxGrid::GetCols

int GetCols() **const**

Returns the number of columns in the grid.

wxGrid::GetColumnWidth

int GetColumnWidth(**int** *col*) **const**

Gets the width in pixels for column *col.*

wxGrid::GetCurrentRect

wxRectangle * GetCurrentRect() const

Returns a pointer to the rectangle enclosing the currently selected cell. Do not delete this pointer.

wxGrid::GetCursorColumn

int GetCursorColumn() const

Returns the column position of the currently selected cell.

wxGrid::GetCursorRow

int GetCursorRow() const

Returns the row position of the currently selected cell.

wxGrid::GetEditable

bool GetEditable() const

Returns TRUE if the grid cells can be edited.

wxGrid::GetEditInPlace

bool GetEditInPlace() const

Returns TRUE if editing in-place is enabled.

wxGrid::GetHorizScrollBar

wxScrollBar * GetHorizScrollBar() const

Returns a pointer to the horizontal scrollbar.

wxGrid::GetLabelAlignment

int GetLabelAlignment(int *orientation*) const

Gets the row or column label alignment. *orientation* should be wxHORIZONTAL to specify column label, wxVERTICAL to specify row label. *alignment* should be wxCENTRE, wxLEFT or wxRIGHT.

wxGrid::GetLabelBackgroundColour

wxColour& GetLabelBackgroundColour() **const**

Gets a row and column label text colour.

wxGrid::GetLabelSize

int GetLabelSize(**int** *orientation*) **const**

Gets the row label height, or column label width, in pixels. *orientation* should be wxHORIZONTAL to specify column label, wxVERTICAL to specify row label.

wxGrid::GetLabelTextColour

wxColour& GetLabelTextColour() **const**

Gets a row and column label text colour.

wxGrid::GetLabelTextFont

wxFont& GetLabelTextFont() **const**

Gets the font to be used for the row and column labels.

wxGrid::GetLabelValue

wxString& GetLabelValue(**int** *orientation*, **int** *pos*) **const**

Gets a row or column label value. *orientation* should be wxHORIZONTAL to specify column label, wxVERTICAL to specify row label. *pos* is the label position.

wxGrid::GetRowHeight

int GetRowHeight(**int** *row*) **const**

Gets the height in pixels for row *row.*

wxGrid::GetRows

int GetRows() const

Returns the number of rows in the grid.

wxGrid::GetScrollPosX

int GetScrollPosX() const

Returns the column scroll position.

wxGrid::GetScrollPosY

int GetScrollPosY() const

Returns the row scroll position.

wxGrid::GetTextItem

wxTextCtrl * GetTextItem() const

Returns a pointer to the text item used for entering text into a cell.

wxGrid::GetVertScrollBar

wxScrollBar * GetVertScrollBar() const

Returns a pointer to the vertical scrollbar.

wxGrid::InsertCols

bool InsertCols(int *pos=0*, int *n=1*, bool *updateLabels=TRUE*)

Inserts *n* number of columns before position *pos*. If *updateLabels* is TRUE, the function OnChangeLabels is called to give the application the opportunity to relabel.

wxGrid::InsertRows

bool InsertRows(int *pos=0*, int *n=1*, bool *updateLabels=TRUE*)

Inserts *n* number of rows before position *pos*. If *updateLabels* is TRUE, the function

OnChangeLabels is called to give the application the opportunity to relabel.

wxGrid::OnActivate

void OnActivate(**bool** *active*)

Sets the text item to have the focus. Call this function when the wxGrid window should have the focus, for example from wxFrame::OnActivate.

wxGrid::OnChangeLabels

void OnChangeLabels()

Called when rows and columns are created or deleted, to allow the application an opportunity to update the labels. By default, columns are labelled alphabetically, and rows numerically.

wxGrid::OnChangeSelectionLabel

void OnChangeSelectionLabel()

Called when a cell is selected, to allow the application an opportunity to update the selection label (the label of the wxTextCtrl used for entering cell text). By default, the cell column letter and row number are concatenated to form the selection label.

wxGrid::OnCreateCell

wxGridCell * OnCreateCell()

Override this virtual function if you want to replace the normal wxGridCell with a derived class.

wxGrid::OnCellLeftClick

void OnLeftClick(**int** *row*, **int** *col*, **int** *x*, **int** *y*, **bool** *control*, **bool** *shift*)

Virtual function called when the left button is depressed within a cell, just after OnSelectCell is called.

wxGrid::OnCellRightClick

void OnRightClick(**int** *row*, **int** *col*, **int** *x*, **int** *y*, **bool** *control*, **bool** *shift*)

Virtual function called when the right button is depressed within a cell, just after OnSelectCell is called.

wxGrid::OnLabelLeftClick

void OnLeftClick(**int** *row*, **int** *col*, **int** *x*, **int** *y*, **bool** *control*, **bool** *shift*)

Virtual function called when the left button is depressed within a label.

row will be *-1* if the click is in the top labels.

col will be *-1* if the click is in the left labels.

row and *col* will be *-1* if the click is in the upper left corner.

wxGrid::OnLabelRightClick

void OnRightClick(**int** *row*, **int** *col*, **int** *x*, **int** *y*, **bool** *control*, **bool** *shift*)

Virtual function called when the right button is depressed within a label.

row will be *-1* if the click is in the top labels.

col will be *-1* if the click is in the left labels.

row and *col* will be *-1* if the click is in the upper left corner.

wxGrid::OnSelectCell

void OnSelectCell(**int** *row*, **int** *col*)

Virtual function called when the user left-clicks on a cell.

wxGrid::OnSelectCellImplementation

void OnSelectCellImplementation(**wxDC** *dc, **int** *row*, **int** *col*)

Virtual function called when the user left-clicks on a cell. If you override this function, call wxGrid::OnSelectCell to apply the default behaviour.

wxGrid::SetCellAlignment

void SetCellAlignment(**int** *alignment*, **int** *row*, **int** *col*)

void SetCellAlignment(**int** *alignment*)

Sets the text alignment for the cell at the given position, or for the whole grid. *alignment* may be wxLEFT, wxRIGHT or wxCENTRE.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **SetCellAlignment(alignment, row, col)**
> **SetDefCellAlignment(alignment)**

wxGrid::SetCellBackgroundColour

void SetCellBackgroundColour(**const wxColour&** *colour*, **int** *row*, **int** *col*)

void SetCellBackgroundColour(**const wxColour&** *colour*)

Sets the background colour for the cell at the given position, or for the whole grid.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **SetCellBackgroundColour(colour, row, col)**
> **SetDefCellBackgroundColour(colour)**

wxGrid::SetCellTextColour

void SetCellTextColour(**const wxColour&** *colour*, **int** *row*, **int** *col*)

void SetCellTextColour(**const wxColour&** *colour*)

Sets the text colour for the cell at the given position, or for the whole grid.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **SetCellTextColour(colour, row, col)**
> **SetDefCellTextColour(colour)**

wxGrid::SetCellTextFont

void SetCellTextFont(**const wxFont&** *font*, **int** *row*, **int** *col*)

void SetCellTextFont(**const wxFont&** *font*)

Sets the text font for the cell at the given position, or for the whole grid.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **SetCellTextFont(font, row, col)**
> **SetDefCellTextFont(font)**

wxGrid::SetCellValue

void SetCellValue(**const wxString&** *val*, **int** *row*, **int** *col*)

Sets the cell value at the given position.

wxGrid::SetColumnWidth

void SetColumnWidth(**int** *col*, **int** *width*)

Sets the width in pixels for column *col*.

wxGrid::SetDividerPen

void SetDividerPen(**const wxPen&** *pen*)

Specifies the pen to be used for drawing the divisions between cells. The default is a light grey. If NULL is specified, the divisions will not be drawn.

wxGrid::SetEditable

void SetEditable(**bool** *editable*)

If *editable* is TRUE (the default), the grid cells will be editable by means of the text edit control. If FALSE, the text edit control will be hidden and the user will not be able to edit the cell contents.

wxGrid::SetEditInPlace

void SetEditInPlace(**bool** *edit = TRUE*)

Enables (if *edit* is TRUE, default value) or disables in-place editing. When it is enabled, the cells contents can be changed by typing text directly in the cell.

wxGrid::SetGridCursor

void SetGridCursor(**int** *row*, **int** *col*)

Sets the position of the selected cell.

wxGrid::SetLabelAlignment

void SetLabelAlignment(**int** *orientation*, **int** *alignment*)

Sets the row or column label alignment. *orientation* should be wxHORIZONTAL to specify column label, wxVERTICAL to specify row label. *alignment* should be wxCENTRE, wxLEFT or wxRIGHT.

wxGrid::SetLabelBackgroundColour

void SetLabelBackgroundColour(**const wxColour&** *value*)

Sets a row or column label background colour.

wxGrid::SetLabelSize

void SetLabelSize(**int** *orientation*, **int** *size*)

Sets the row label height, or column label width, in pixels. *orientation* should be wxHORIZONTAL to specify column label, wxVERTICAL to specify row label.

If a dimension of zero is specified, the row or column labels will not be shown.

wxGrid::SetLabelTextColour

void SetLabelTextColour(**const wxColour&** *value*)

Sets a row and column label text colour.

wxGrid::SetLabelTextFont

void SetLabelTextFont(**const wxFont&** *font*)

Sets the font to be used for the row and column labels.

wxGrid::SetLabelValue

void SetLabelValue(**int** *orientation*, **const wxString&** *value*, **int** *pos*)

Sets a row or column label value. *orientation* should be wxHORIZONTAL to specify column label, wxVERTICAL to specify row label. *pos* is the label position.

wxGrid::SetRowHeight

void SetRowHeight(**int** *row*, **int** *height*)

Sets the height in pixels for row *row*.

wxGrid::UpdateDimensions

void UpdateDimensions()

Call this function whenever a change has been made via the API that might alter size characteristics. You may also need to follow it with a call to AdjustScrollbars.

wxGridSizer

A grid sizer is a sizer which lays out its children in a two-dimensional table with all table fields having the same size, i.e. the width of each field is the width of the widest child, the height of each field is the height of the tallest child.

Derived from

wxSizer (p. 929)
wxObject (p. 750)

wxGridSizer::wxGridSizer

wxGridSizer(**int** *cols*, **int** *rows*, **int** *vgap*, **int** *hgap*)

wxGridSizer(**int** *cols*, **int** *vgap = 0*, **int** *hgap = 0*)

Constructor for a wxGridSizer. *rows* and *cols* determine the number of columns and rows in the sizer - if either of the parameters is zero, it will be calculated to form the total number of children in the sizer, thus making the sizer grow dynamically. *vgap* and *hgap* define extra space between all children.

wxHashTable

This class provides hash table functionality for wxWindows, and for an application if it wishes. Data can be hashed on an integer or string key.

Derived from

wxObject (p. 750)

Include files

<wx/hash.h>

Example

Below is an example of using a hash table.

```
wxHashTable table(KEY_STRING);

wxPoint *point = new wxPoint(100, 200);
table.Put("point 1", point);

....

wxPoint *found_point = (wxPoint *)table.Get("point 1");
```

A hash table is implemented as an array of pointers to lists. When no data has been stored, the hash table takes only a little more space than this array (default size is 1000). When a data item is added, an integer is constructed from the integer or string key that is within the bounds of the array. If the array element is NULL, a new (keyed) list is created for the element. Then the data object is appended to the list, storing the key in case other data objects need to be stored in the list also (when a 'collision' occurs).

Retrieval involves recalculating the array index from the key, and searching along the keyed list for the data object whose stored key matches the passed key. Obviously this is quicker when there are fewer collisions, so hashing will become inefficient if the number of items to be stored greatly exceeds the size of the hash table.

See also

wxList (p. 619)

wxHashTable::wxHashTable

wxHashTable(**unsigned int** *key_type*, **int** *size = 1000*)

Constructor. *key_type* is one of wxKEY_INTEGER, or wxKEY_STRING, and indicates what sort of keying is required. *size* is optional.

wxHashTable::~wxHashTable

~wxHashTable()

Destroys the hash table.

wxHashTable::BeginFind

void BeginFind()

The counterpart of *Next*. If the application wishes to iterate through all the data in the hash table, it can call *BeginFind* and then loop on *Next*.

wxHashTable::Clear

void Clear()

Clears the hash table of all nodes (but as usual, doesn't delete user data).

wxHashTable::Delete

wxObject * Delete(**long** *key*)

wxObject * Delete(**const wxString&** *key*)

Deletes entry in hash table and returns the user's data (if found).

wxHashTable::DeleteContents

void DeleteContents(**bool** *flag*)

If set to TRUE data stored in hash table will be deleted when hash table object is destroyed.

wxHashTable::Get

wxObject * Get(**long** *key*)

wxObject * Get(**const char*** *key*)

Gets data from the hash table, using an integer or string key (depending on which has table constructor was used).

wxHashTable::MakeKey

long MakeKey(**const wxString&** *string*)

Makes an integer key out of a string. An application may wish to make a key explicitly (for instance when combining two data values to form a key).

wxHashTable::Next

wxNode * Next()

If the application wishes to iterate through all the data in the hash table, it can call *BeginFind* and then loop on *Next*. This function returns a **wxNode** pointer (or NULL if there are no more nodes). See the description for *wxNode* (p. 739). The user will probably only wish to use the **wxNode::Data** function to retrieve the data; the node may also be deleted.

wxHashTable::Put

void Put(**long** *key*, **wxObject** **object*)

void Put(**const char*** *key*, **wxObject** **object*)

Inserts data into the hash table, using an integer or string key (depending on which has table constructor was used). The key string is copied and stored by the hash table implementation.

wxList::GetCount

size_t GetCount() **const**

Returns the number of elements in the hash table.

wxHelpController

This is a family of classes by which applications may invoke a help viewer to provide on-line help.

A help controller allows an application to display help, at the contents or at a particular topic, and shut the help program down on termination. This avoids proliferation of many instances of the help viewer whenever the user requests a different topic via the application's menus or buttons.

Typically, an application will create a help controller instance when it starts, and immediately call **Initialize** to associate a filename with it. The help viewer will only get run, however, just before the first call to display something.

Most help controller classes actually derive from wxHelpControllerBase and have names of the form wxXXXHelpController or wxHelpControllerXXX. An appropriate class is aliased to the name wxHelpController for each platform, as follows:

- On Windows, wxWinHelpController is used.
- On all other platforms, wxHelpControllerHtml is used if wxHTML is compiled into wxWindows; otherwise wxExtHelpController is used (for invoking an external browser).

The remaining help controller classess need to be named explicitly by an application that wishes to make use of them.

There are currently the following help controller classes defined:

- wxWinHelpController, for controlling Windows Help.
- wxCHMHelpController, for controlling MS HTML Help. To use this, you need to set wxUSE_MS_HTML_HELP to 0 in setup.h, and link your application with Microsoft's htmlhelp.lib. Currently VC++ only.
- wxExtHelpController, for controlling external browsers under Unix. The default browser is Netscape Navigator. The 'help' sample shows its use.
- wxHelpControllerHtml, using *wxHTML* (p. 1442) to display help. See `wx/helpwxht.h` for details of use.
- *wxHtmlHelpController* (p. 522), a more sophisticated help controller using *wxHTML* (p. 1442), in a similar style to the Microsoft HTML Help viewer and using some of the same files. Although it has an API compatible with other help controllers, it has more advanced features, so it is recommended that you use the specific API for this class instead.

Derived from

wxHelpControllerBase
wxObject (p. 750)

Include files

<wx/help.h> (wxWindows chooses the appropriate help controller class)
<wx/helpbase.h> (wxHelpControllerBase class)
<wx/helpwin.h> (Windows Help controller)
<wx/msw/helpchm.h> (MS HTML Help controller)
<wx/generic/helpext.h> (external HTML browser controller)
<wx/generic/helpwxht.h> (simple wxHTML-based help controller)
<wx/html/helpctrl.h> (advanced wxHTML based help controller: wxHtmlHelpController)

See also

wxHtmlHelpController (p. 522), *wxHTML* (p. 1442)

wxHelpController::wxHelpController

wxHelpController()

Constructs a help instance object, but does not invoke the help viewer.

wxHelpController::~wxHelpController

~wxHelpController()

Destroys the help instance, closing down the viewer if it is running.

wxHelpController::Initialize

virtual void Initialize(**const wxString&** *file*)

virtual void Initialize(**const wxString&** *file*, **int** *server*)

Initializes the help instance with a help filename, and optionally a server socket number if using wxHelp (now obsolete). Does not invoke the help viewer. This must be called directly after the help instance object is created and before any attempts to communicate with the viewer.

You may omit the file extension and a suitable one will be chosen. For wxHtmlHelpController, the extensions zip, htb and hhp will be appended while searching for a suitable file. For WinHelp, the hlp extension is appended. For wxHelpControllerHtml (the standard HTML help controller), the filename is assumed to be a directory containing the HTML files.

wxHelpController::DisplayBlock

virtual bool DisplayBlock(**long** *blockNo*)

If the help viewer is not running, runs it and displays the file at the given block number.

WinHelp: Refers to the context number.

MS HTML Help: Refers to the context number.

External HTML help: the same as for *wxHelpController::DisplaySection* (p. 501).

wxHtmlHelpController: sectionNo is an identifier as specified in the .hhc file. See *Help*

files format (p. 1443).

This function is for backward compatibility only, and applications should use *wxHelpController* (p. 501) instead.

wxHelpController::DisplayContents

virtual bool DisplayContents()

If the help viewer is not running, runs it and displays the contents.

wxHelpController::DisplaySection

virtual bool DisplaySection(**const wxString&** *section*)

If the help viewer is not running, runs it and displays the given section.

The interpretation of *section* differs between help viewers. For most viewers, this call is equivalent to KeywordSearch. For MS HTML Help, external HTML help and simple wxHTML help, if *section* has a .htm or .html extension, that HTML file will be displayed; otherwise a keyword search is done.

virtual bool DisplaySection(**int** *sectionNo*)

If the help viewer is not running, runs it and displays the given section.

WinHelp, MS HTML Help: sectionNo is a context id.

External HTML help/simple wxHTML help: wxExtHelpController and wxHelpControllerHtml implement *sectionNo* as an id in a map file, which is of the form:

```
0   wx.html               ; Index
1   wx34.html#classref    ; Class reference
2   wx204.html            ; Function reference
```

wxHtmlHelpController: sectionNo is an identifier as specified in the .hhc file. See *Help files format* (p. 1443).

See also the help sample for notes on how to specify section numbers for various help file formats.

wxHelpController::GetFrameParameters

virtual wxFrame * GetFrameParameters(**const wxSize *** *size = NULL*, **const wxPoint * *pos = NULL*, **bool ***newFrameEachTime = NULL*)

This reads the current settings for the help frame in the case of the

wxHelpControllerHtml, setting the frame size, position and the newFrameEachTime parameters to the last values used. It also returns the pointer to the last opened help frame. This can be used for example, to automatically close the help frame on program shutdown.

wxHtmlHelpController returns the frame, size and position.

For all other help controllers, this function does nothing and just returns NULL.

Parameters

viewer
> This defaults to "netscape" for wxExtHelpController.

flags
> This defaults to wxHELP_NETSCAPE for wxExtHelpController, indicating that the viewer is a variant of Netscape Navigator.

wxHelpController::KeywordSearch

virtual bool KeywordSearch(**const wxString&** *keyWord*)

If the help viewer is not running, runs it, and searches for sections matching the given keyword. If one match is found, the file is displayed at this section.

WinHelp, MS HTML Help: If more than one match is found, the first topic is displayed.

External HTML help, simple wxHTML help: If more than one match is found, a choice of topics is displayed.

wxHtmlHelpController: see *wxHtmlHelpController::KeywordSearch* (p. 525).

wxHelpController::LoadFile

virtual bool LoadFile(**const wxString&** *file = ""*)

If the help viewer is not running, runs it and loads the given file. If the filename is not supplied or is empty, the file specified in **Initialize** is used. If the viewer is already displaying the specified file, it will not be reloaded. This member function may be used before each display call in case the user has opened another file.

wxHtmlHelpController ignores this call.

wxHelpController::OnQuit

virtual bool OnQuit()

Overridable member called when this application's viewer is quit by the user.

This does not work for all help controllers.

wxHelpController::SetFrameParameters

virtual void SetFrameParameters(**const wxString &** *title*, **const wxSize &** *size*, **const wxPoint &** *pos* = *wxDefaultPosition*, **bool** *newFrameEachTime* = *FALSE*)

For wxHelpControllerHtml, this allows the application to set the default frame title, size and position for the frame. If the title contains %s, this will be replaced with the page title. If the parameter newFrameEachTime is set, the controller will open a new help frame each time it is called.

For wxHtmlHelpController, the title is set (again with %s indicating the page title) and also the size and position of the frame if the frame is already open. *newFrameEachTime* is ignored.

For all other help controllers this function has no effect.

wxHelpController::SetViewer

virtual void SetViewer(**const wxString&** *viewer*, **long** *flags*)

Sets detailed viewer information. So far this is only relevant to wxExtHelpController.

Some examples of usage:

```
m_help.SetViewer("kdehelp");
m_help.SetViewer("gnome-help-browser");
m_help.SetViewer("netscape", wxHELP_NETSCAPE);
```

wxHelpController::Quit

virtual bool Quit()

If the viewer is running, quits it by disconnecting.

For Windows Help, the viewer will only close if no other application is using it.

wxHtmlCell

Internal data structure. It represents fragments of parsed HTML page, the so-called **cell** - a word, picture, table, horizontal line and so on. It is used by *wxHtmlWindow* (p. 546)

and *wxHtmlWinParser* (p. 552) to represent HTML page in memory.

You can divide cells into two groups : *visible* cells with non-zero width and height and *helper* cells (usually with zero width and height) that perform special actions such as color or font change.

Derived from

wxObject (p. 750)

Include files

<wx/html/htmlcell.h>

See Also

Cells Overview (p. 1445), *wxHtmlContainerCell* (p. 510)

wxHtmlCell::wxHtmlCell

wxHtmlCell()

Constructor.

wxHtmlCell::AdjustPagebreak

virtual bool AdjustPagebreak(**int *** *pagebreak*)

This method is used to adjust pagebreak position. The parameter is variable that contains y-coordinate of page break (= horizontal line that should not be crossed by words, images etc.). If this cell cannot be divided into two pieces (each one on another page) then it moves the pagebreak few pixels up.

Returns TRUE if pagebreak was modified, FALSE otherwise

Usage:
```
while (container->AdjustPagebreak(&p)) {}
```

wxHtmlCell::Draw

virtual void Draw(**wxDC&** *dc*, **int** *x*, **int** *y*, **int** *view_y1*, **int** *view_y2*)

Renders the cell.

Parameters

dc

> Device context to which the cell is to be drawn

x,y

> Coordinates of parent's upper left corner (origin). You must add this to
> m_PosX,m_PosY when passing coordinates to dc's methods Example : dc ->
> DrawText("hello", x + m_PosX, y + m_PosY)

view_y1

> y-coord of the first line visible in window. This is used to optimize rendering speed

view_y2

> y-coord of the last line visible in window. This is used to optimize rendering speed

wxHtmlCell::DrawInvisible

virtual void DrawInvisible(wxDC& *dc*, int *x*, int *y*)

This method is called instead of *Draw* (p. 504) when the cell is certainly out of the screen
(and thus invisible). This is not nonsense - some tags (like *wxHtmlColourCell* (p. 509)or
font setter) must be drawn even if they are invisible!

Parameters

dc

> Device context to which the cell is to be drawn

x,y

> Coordinates of parent's upper left corner. You must add this to m_PosX,m_PosY
> when passing coordinates to dc's methods Example : dc ->
> DrawText("hello", x + m_PosX, y + m_PosY)

wxHtmlCell::Find

virtual const wxHtmlCell* Find(int *condition*, const void* *param*)

Returns pointer to itself if this cell matches condition (or if any of the cells following in the
list matches), NULL otherwise. (In other words if you call top-level container's Find it will
return pointer to the first cell that matches the condition)

It is recommended way how to obtain pointer to particular cell or to cell of some type
(e.g. wxHtmlAnchorCell reacts on wxHTML_COND_ISANCHOR condition)

Parameters

condition

> Unique integer identifier of condition

param
    Optional parameters

Defined conditions

wxHTML_COND_ISANCHOR   Finds particular anchor. *param* is pointer to
                                wxString with name of the anchor.
wxHTML_COND_USER   User-defined conditions start from this number.

wxHtmlCell::GetDescent

int GetDescent() **const**

Returns descent value of the cell (m_Descent member). See explanation:
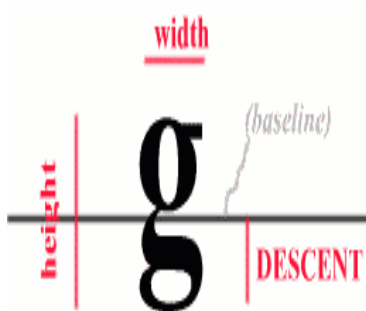
wxHtmlCell::GetHeight

int GetHeight() **const**

Returns height of the cell (m_Height member).

wxHtmlCell::GetLink

virtual wxHtmlLinkInfo* GetLink(**int** *x = 0*, **int** *y = 0*) **const**

Returns hypertext link if associated with this cell or NULL otherwise. See *wxHtmlLinkInfo*
(p. 532). (Note: this makes sense only for visible tags).

Parameters

x,y
    Coordinates of position where the user pressed mouse button. These coordinates
    are used e.g. by COLORMAP. Values are relative to the upper left corner of THIS

cell (i.e. from 0 to m_Width or m_Height)

wxHtmlCell::GetNext

wxHtmlCell* GetNext() const

Returns pointer to the next cell in list (see htmlcell.h if you're interested in details).

wxHtmlCell::GetParent

wxHtmlContainerCell* GetParent() const

Returns pointer to parent container.

wxHtmlCell::GetPosX

int GetPosX() const

Returns X position within parent (the value is relative to parent's upper left corner). The returned value is meaningful only if parent's *Layout* (p. 507) was called before!

wxHtmlCell::GetPosY

int GetPosY() const

Returns Y position within parent (the value is relative to parent's upper left corner). The returned value is meaningful only if parent's *Layout* (p. 507) was called before!

wxHtmlCell::GetWidth

int GetWidth() const

Returns width of the cell (m_Width member).

wxHtmlCell::Layout

virtual void Layout(int *w*)

This method performs two actions:

1. adjusts the cell's width according to the fact that maximal possible width is *w*. (this has sense when working with horizontal lines, tables etc.)
2. prepares layout (=fill-in m_PosX, m_PosY (and sometimes m_Height) members)

based on actual width *w*

It must be called before displaying cells structure because m_PosX and m_PosY are undefined (or invalid) before calling Layout.

wxHtmlCell::OnMouseClick

virtual void OnMouseClick(**wxWindow*** *parent*, **int***x*, **int** *y*, **const wxMouseEvent&** *event*)

This function is simple event handler. Each time the user clicks mouse button over a cell within *wxHtmlWindow* (p. 546) this method of that cell is called. Default behavior is that it calls *wxHtmlWindow::LoadPage* (p. 548).

Note

If you need more "advanced" event handling you should use wxHtmlBinderCell instead.

Parameters

parent
    parent window (always wxHtmlWindow!)

x, y
    coordinates of mouse click (this is relative to cell's origin

left, middle, right
    boolean flags for mouse buttons. TRUE if the left/middle/right button is pressed, FALSE otherwise

wxHtmlCell::SetLink

void SetLink(**const wxHtmlLinkInfo&** *link*)

Sets the hypertext link asocciated with this cell. (Default value is *wxHtmlLinkInfo* (p. 532)("", "") (no link))

wxHtmlCell::SetNext

void SetNext(**wxHtmlCell** **cell*)

Sets the next cell in the list. This shouldn't be called by user - it is to be used only by *wxHtmlContainerCell::InsertCell* (p. 511).

wxHtmlCell::SetParent

void SetParent(**wxHtmlContainerCell** **p*)

Sets parent container of this cell. This is called from *wxHtmlContainerCell::InsertCell* (p. 511).

wxHtmlCell::SetPos

void SetPos(**int** *x*, **int** *y*)

Sets the cell's position within parent container.

wxHtmlColourCell

This cell changes the colour of either the background or the foreground.

Derived from

wxHtmlCell (p. 503)

Include files

<wx/html/htmlcell.h>

wxHtmlColourCell::wxHtmlColourCell

wxHtmlColourCell(**wxColour** *clr*, **int** *flags = wxHTML_CLR_FOREGROUND*)

Constructor.

Parameters

clr
　　The color

flags
　　Can be one of following:

wxHTML_CLR_FOREGROUND	change color of text
wxHTML_CLR_BACKGROUND	change background color

wxHtmlContainerCell

The wxHtmlContainerCell class is an implementation of a cell that may contain more cells in it. It is heavily used in the wxHTML layout algorithm.

Derived from

wxHtmlCell (p. 503)

Include files

<wx/html/htmlcell.h>

See Also

Cells Overview (p. 1445)

wxHtmlContainerCell::wxHtmlContainerCell

wxHtmlContainerCell(**wxHtmlContainerCell** **parent*)

Constructor. *parent* is pointer to parent container or NULL.

wxHtmlContainerCell::GetAlignHor

int GetAlignHor() **const**

Returns container's horizontal alignment.

wxHtmlContainerCell::GetAlignVer

int GetAlignVer() **const**

Returns container's vertical alignment.

wxHtmlContainerCell::GetFirstCell

wxHtmlCell* GetFirstCell()

Returns pointer to the first cell in the list. You can then use wxHtmlCell's GetNext method to obtain pointer to the next cell in list.

Note: This shouldn't be used by the end user. If you need some way of finding particular cell in the list, try *Find* (p. 505) method instead.

wxHtmlContainerCell::GetIndent

int GetIndent(**int** *ind*) **const**

Returns the indentation. *ind* is one of the **wxHTML_INDENT_*** constants.

Note: You must call *GetIndentUnits* (p. 511) with same *ind* parameter in order to correctly interpret the returned integer value. It is NOT always in pixels!

wxHtmlContainerCell::GetIndentUnits

int GetIndentUnits(**int** *ind*) **const**

Returns the units of indentation for *ind* where *ind* is one of the **wxHTML_INDENT_*** constants.

wxHtmlContainerCell::InsertCell

void InsertCell(**wxHtmlCell** **cell*)

Inserts new cell into the container.

wxHtmlContainerCell::SetAlign

void SetAlign(**const wxHtmlTag&** *tag*)

Sets the container's alignment (both horizontal and vertical) according to the values stored in *tag*. (Tags ALIGN parameter is extracted.) In fact it is only a front-end to *SetAlignHor* (p. 511) and *SetAlignVer* (p. 512).

wxHtmlContainerCell::SetAlignHor

void SetAlignHor(**int** *al*)

Sets the container's *horizontal alignment*. During *Layout* (p. 507) each line is aligned according to *al* value.

Parameters

al
    new horizontal alignment. May be one of these values:

wxHTML_ALIGN_LEFT   lines are left-aligned (default)
wxHTML_ALIGN_JUSTIFY lines are justified
wxHTML_ALIGN_CENTER lines are centered
wxHTML_ALIGN_RIGHT   lines are right-aligned

wxHtmlContainerCell::SetAlignVer

void SetAlignVer(**int** *al*)

Sets the container's *vertical alignment*. This is per-line alignment!

Parameters

al
    new vertical alignment. May be one of these values:

    wxHTML_ALIGN_BOTTOM cells are over the line (default)
    wxHTML_ALIGN_CENTER cells are centered on line
    wxHTML_ALIGN_TOP   cells are under the line
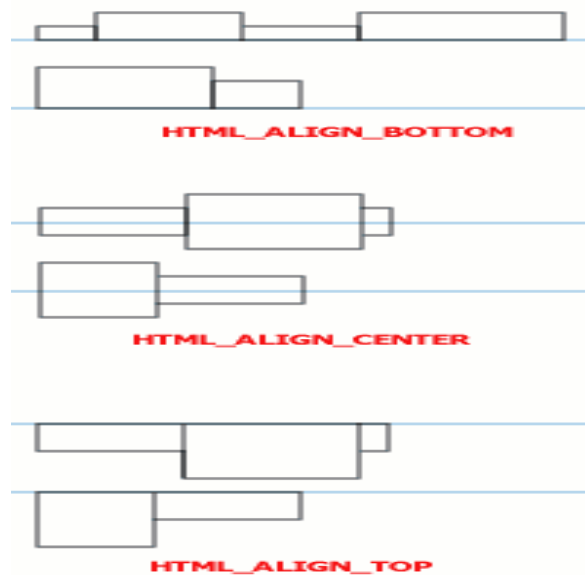
wxHtmlContainerCell::SetBackgroundColour

void SetBackgroundColour(**const wxColour&** *clr*)

Sets the background colour for this container.

wxHtmlContainerCell::SetBorder

void SetBorder(**const wxColour&** *clr1*, **const wxColour&** *clr2*)

Sets the border (frame) colours. A border is a rectangle around the container.

Parameters

clr1

    Colour of top and left lines

clr2

    Colour of bottom and right lines

wxHtmlContainerCell::SetIndent

void SetIndent(**int** *i*, **int** *what*, **int** *units = wxHTML_UNITS_PIXELS*)

Sets the indentation (free space between borders of container and subcells).

Parameters

i

    Indentation value.

what

    Determines which of the four borders we're setting. It is OR combination of following constants:

    wxHTML_INDENT_TOP   top border
    wxHTML_INDENT_BOTTOM bottom
    wxHTML_INDENT_LEFT   left
    wxHTML_INDENT_RIGHT right
    wxHTML_INDENT_HORIZONTAL   left and right
    wxHTML_INDENT_VERTICAL   top and bottom
    wxHTML_INDENT_ALL   all 4 borders
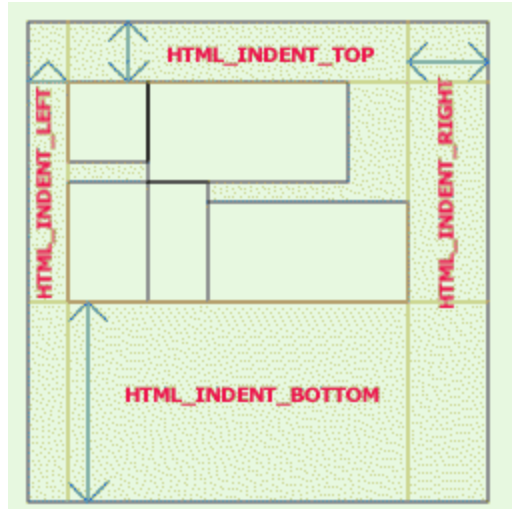
units

 Units of *i*. This parameter affects interpretation of value.

 wxHTML_UNITS_PIXELS *i* is number of pixels
 wxHTML_UNITS_PERCENT *i* is interpreted as percents of width of parent
                              container

wxHtmlContainerCell::SetMinHeight

void SetMinHeight(**int** *h*, **int** *align = wxHTML_ALIGN_TOP*)

Sets minimal height of the container.

When container's *Layout* (p. 507) is called, m_Height is set depending on layout of subcells to the height of area covered by layed-out subcells. Calling this method guarantees you that the height of container is never smaller than *h* - even if the subcells cover much smaller area.

Parameters

h

 The minimal height.

align

 If height of the container is lower than the minimum height, empty space must be inserted somewhere in order to ensure minimal height. This parameter is one of **wxHTML_ALIGN_TOP, wxHTML_ALIGN_BOTTOM, wxHTML_ALIGN_CENTER**. It refers to the *contents*, not to the empty place.

wxHtmlContainerCell::SetWidthFloat

void SetWidthFloat(**int** *w*, **int** *units*)

void SetWidthFloat(**const wxHtmlTag&** *tag*, **double** *pixel_scale = 1.0*)

Sets floating width adjustment.

The normal behaviour of container is that its width is the same as the width of parent container (and thus you can have only one sub-container per line). You can change this by setting FWA.

pixel_scale is number of real pixels that equals to 1 HTML pixel.

Parameters

w

> Width of the container. If the value is negative it means complement to full width of parent container (e.g. SetWidthFloat(-50, wxHTML_UNITS_PIXELS) sets the width of container to parent's width minus 50 pixels. This is useful when creating tables - you can call SetWidthFloat(50) and SetWidthFloat(-50))

units

> Units of *w* This parameter affects the interpretation of value.

> **wxHTML_UNITS_PIXELS**   *w* is number of pixels
> **wxHTML_UNITS_PERCENT**   *w* is interpreted as percents of width of parent
>   container

tag

> In the second version of method, *w* and *units* info is extracted from tag's WIDTH parameter.

wxPython note: The second form of this method is named SetWidthFloatFromTag in wxPython.

wxHtmlDCRenderer

This class can render HTML document into a specified area of a DC. You can use it in your own printing code, although use of *wxHtmlEasyPrinting* (p. 518) or *wxHtmlPrintout* (p. 537) is strongly recommended.

Derived from

wxObject (p. 750)

Include files

<wx/html/htmprint.h>

wxHtmlDCRenderer::wxHtmlDCRenderer

wxHtmlDCRenderer()

Constructor.

wxHtmlDCRenderer::SetDC

void SetDC(**wxDC*** *dc*, **double** *pixel_scale = 1.0*)

Assign DC instance to the renderer.

pixel_scale can be used when rendering to high-resolution DCs (e.g. printer) to adjust size of pixel metrics. (Many dimensions in HTML are given in pixels -- e.g. image sizes. 300x300 image would be only one inch wide on typical printer. With pixel_scale = 3.0 it would be 3 inches.)

Parameters

maxwidth
> width of the area (on this DC) that is equivalent to screen's width, in pixels (you should set it to page width minus margins).

> **Note:** In the current implementation the screen width is always 800 pixels: it gives best results and ensures (almost) same printed outputs across platforms and differently configured desktops.

See also *SetSize* (p. 516).

wxHtmlDCRenderer::SetSize

void SetSize(**int** *width*, **int** *height*)

Set size of output rectangle, in pixels. Note that you **can't** change width of the rectangle between calls to *Render* (p. 517)! (You can freely change height.)

wxHtmlDCRenderer::SetHtmlText

void SetHtmlText(**const wxString&** *html*, **const wxString&** *basepath = wxEmptyString*, **bool** *isdir = TRUE*)

Assign text to the renderer. *Render* (p. 517) then draws the text onto DC.

Parameters

html
> HTML text. This is *not* a filename.

basepath
> base directory (html string would be stored there if it was in file). It is used to determine path for loading images, for example.

isdir
> FALSE if basepath is filename, TRUE if it is directory name (see *wxFileSystem* (p. 425) for detailed explanation)

wxHtmlDCRenderer::Render

int Render(**int** *x*, **int** *y*, **int** *from = 0*, **int** *dont_render = FALSE*)

Renders HTML text to the DC.

Parameters

x,y
> position of upper-left corner of printing rectangle (see *SetSize* (p. 516))

from
> y-coordinate of the very first visible cell

dont_render
> if TRUE then this method only returns y coordinate of the next page and does not output anything

Returned value is y coordinate of first cell than didn't fit onto page. Use this value as *from* in next call to Render in order to print multipages document.

Caution!

The Following three methods **must** always be called before any call to Render (preferably in this order):

- *SetDC* (p. 516)
- *SetSize* (p. 516)
- *SetHtmlText* (p. 516)

Render() changes the DC's user scale and does NOT restore it.

wxHtmlDCRenderer::GetTotalHeight

int GetTotalHeight()

Returns the height of the HTML text. This is important if area height (see *SetSize* (p. 516)) is smaller that total height and thus the page cannot fit into it. In that case you're supposed to call *Render* (p. 517) as long as its return value is smaller than GetTotalHeight's.

wxHtmlEasyPrinting

This class provides very simple interface to printing architecture. It allows you to print HTML documents using only a few commands.

Note

Do not create this class on the stack only. You should create an instance on app startup and use this instance for all printing operations. The reason is that this class stores various settings in it.

Derived from

wxObject (p. 750)

Include files

<wx/html/htmprint.h>

wxHtmlEasyPrinting::wxHtmlEasyPrinting

 wxHtmlEasyPrinting(**const wxString&** *name = "Printing"*, **wxFrame*** *parent_frame = NULL*)

Constructor.

Parameters

name
  Name of the printing. Used by preview frames and setup dialogs.

parent_frame
  pointer to the frame that will own preview frame and setup dialogs. May be NULL.

wxHtmlEasyPrinting::PreviewFile

bool PreviewFile(**const wxString&** *htmlfile*)

Preview HTML file.

Returns FALSE in case of error -- call *wxPrinter::GetLastError* (p. 809) to get detailed information about the kind of the error.

wxHtmlEasyPrinting::PreviewText

bool PreviewText(**const wxString&** *htmltext,* **const wxString&** *basepath* = *wxEmptyString*)

Preview HTML text (not file!).

Returns FALSE in case of error -- call *wxPrinter::GetLastError* (p. 809) to get detailed information about the kind of the error.

Parameters

htmltext
    HTML text.

basepath
    base directory (html string would be stored there if it was in file). It is used to determine path for loading images, for example.

wxHtmlEasyPrinting::PrintFile

bool PrintFile(**const wxString&** *htmlfile*)

Print HTML file.

Returns FALSE in case of error -- call *wxPrinter::GetLastError* (p. 809) to get detailed information about the kind of the error.

wxHtmlEasyPrinting::PrintText

bool PrintText(**const wxString&** *htmltext,* **const wxString&** *basepath* = *wxEmptyString*)

Print HTML text (not file!).

Returns FALSE in case of error -- call *wxPrinter::GetLastError* (p. 809) to get detailed information about the kind of the error.

Parameters

htmltext
> HTML text.

basepath
> base directory (html string would be stored there if it was in file). It is used to determine path for loading images, for example.

wxHtmlEasyPrinting::PrinterSetup

void PrinterSetup()

Display printer setup dialog and allows the user to modify settings.

wxHtmlEasyPrinting::PageSetup

void PageSetup()

Display page setup dialog and allows the user to modify settings.

wxHtmlEasyPrinting::SetHeader

void SetHeader(**const wxString&** *header*, **int** *pg = wxPAGE_ALL*)

Set page header.

Parameters

header
> HTML text to be used as header. You can use macros in it:

> - @PAGENUM@ is replaced by page number
> - @PAGESCNT@ is replaced by total number of pages

pg
> one of wxPAGE_ODD, wxPAGE_EVEN and wxPAGE_ALL constants.

wxHtmlEasyPrinting::SetFooter

void SetFooter(**const wxString&** *footer*, **int** *pg = wxPAGE_ALL*)

Set page footer.

Parameters

footer
> HTML text to be used as footer. You can use macros in it:

- @PAGENUM@ is replaced by page number
- @PAGESCNT@ is replaced by total number of pages

pg

one of wxPAGE_ODD, wxPAGE_EVEN and wxPAGE_ALL constants.

wxHtmlEasyPrinting::GetPrintData

wxPrintData* GetPrintData()

Returns pointer to *wxPrintData* (p. 796) instance used by this class. You can set its parameters (via SetXXXX methods).

wxHtmlEasyPrinting::GetPageSetupData

wxPageSetupDialogData* GetPageSetupData()

Returns a pointer to *wxPageSetupDialogData* (p. 756) instance used by this class. You can set its parameters (via SetXXXX methods).

wxHtmlFilter

This class is an input filter for *wxHtmlWindow* (p. 546). It allows you to read and display files of different file formats.

Derived from

wxObject (p. 750)

Include files

<wx/html/htmlfilt.h>

See Also

Overview (p. 1445)

wxHtmlFilter::wxHtmlFilter

wxHtmlFilter()

Constructor.

wxHtmlFilter::CanRead

bool CanRead(**const wxFSFile&** *file*)

Returns TRUE if this filter is capable of reading file *file.*

Example:

```
bool MyFilter::CanRead(const wxFSFile& file)
{
    return (file.GetMimeType() == "application/x-ugh");
}
```

wxHtmlFilter::ReadFile

wxString ReadFile(**const wxFSFile&** *file*)

Reads the file and returns string with HTML document.

Example:

```
wxString MyImgFilter::ReadFile(const wxFSFile& file)
{
    return "<html><body><img src=\"" +
            file.GetLocation() +
          "\"></body></html>";
}
```

wxHtmlHelpController

WARNING! Although this class has an API compatible with other wxWindows help controllers as documented by *wxHelpController* (p. 498), it is recommended that you use the enhanced capabilities of wxHtmlHelpController's API.

This help controller provides an easy way of displaying HTML help in your application (see *test* sample). The help system is based on **books** (see *AddBook* (p. 523)). A book is a logical section of documentation (for example "User's Guide" or "Programmer's Guide" or "C++ Reference" or "wxWindows Reference"). The help controller can handle as many books as you want.

wxHTML uses Microsoft's HTML Help Workshop project files (.hhp, .hhk, .hhc) as its native format. The file format is described *here* (p. 1443). Have a look at docs/html/ directory where sample project files are stored.

You can use Tex2RTF to produce these files when generating HTML, if you set **htmlWorkshopFiles** to **true** in your tex2rtf.ini file.

In order to use the controller in your application under Windows you must have the following line in your .rc file:

```
#include "wx/html/msw/wxhtml.rc"
```

Note

It is strongly recommended to use preprocessed **.hhp.cached** version of projects. It can be either created on-the-fly (see *SetTempDir* (p. 525)) or you can use **hhp2cached** utility from *utils/hhp2cached* to create it and distribute the cached version together with helpfiles. See *samples/html/help* sample for demonstration of its use.

Derived from

wxHelpControllerBase

Include files

<wx/html/helpctrl.h>

wxHtmlHelpController::wxHtmlHelpController

 wxHtmlHelpController(**int** *style = wxHF_DEFAULTSTYLE*)

Constructor.

Parameters

style is combination of these flags:

wxHF_TOOLBAR	Help frame has toolbar.
wxHF_FLATTOOLBAR	Help frame has toolbar with flat buttons (aka coolbar).
wxHF_CONTENTS	Help frame has contents panel.
wxHF_INDEX	Help frame has index panel.
wxHF_SEARCH	Help frame has search panel.
wxHF_BOOKMARKS	Help frame has bookmarks controls.
wxHF_OPENFILES	Allow user to open arbitrary HTML document.
wxHF_PRINT	Toolbar contains "print" button.

Default value: everything but wxHF_OPENFILES enabled.

wxHtmlHelpController::AddBook

bool AddBook(**const wxString&** *book*, **bool** *show_wait_msg*)

Adds book (*.hhp file* (p. 1443) - HTML Help Workshop project file) into the list of loaded books. This must be called at least once before displaying any help.

book may be either .hhp file or ZIP archive that contains arbitrary number of .hhp files in top-level directory. This ZIP archive must have .zip or .htb extension (the latter stands for "HTML book"). In other words, `AddBook("help.zip")` is possible and, in fact, recommended way.

If *show_wait_msg* is TRUE then a decorationless window with progress message is displayed.

wxHtmlHelpController::CreateHelpFrame

virtual wxHtmlHelpFrame* CreateHelpFrame (**wxHtmlHelpData *** *data*)

This protected virtual method may be overridden so that the controller uses slightly different frame. See *samples/html/helpview* sample for an example.

wxHtmlHelpController::Display

void Display(**const wxString&** *x*)

Displays page *x*. This is THE important function - it is used to display the help in application.

You can specify the page in many ways:

- as direct filename of HTML document
- as chapter name (from contents) or as a book name
- as some word from index
- even as any word (will be searched)

Looking for the page runs in these steps:

1. try to locate file named x (if x is for example "doc/howto.htm")
2. try to open starting page of book named x
3. try to find x in contents (if x is for example "How To ...")
4. try to find x in index (if x is for example "How To ...")
5. switch to Search panel and start searching

void Display(**const int** *id*)

This alternative form is used to search help contents by numeric IDs.

wxPython note: The second form of this method is named DisplayId in wxPython.

wxHtmlHelpController::DisplayContents

void DisplayContents()

Displays help window and focuses contents panel.

wxHtmlHelpController::DisplayIndex

void DisplayIndex()

Displays help window and focuses index panel.

wxHtmlHelpController::KeywordSearch

bool KeywordSearch(const wxString& *keyword*)

Displays help window, focuses search panel and starts searching. Returns TRUE if the keyword was found.

Important: KeywordSearch searches only pages listed in .hhc file(s). You should list all pages in the contents file.

wxHtmlHelpController::ReadCustomization

void ReadCustomization(wxConfigBase* *cfg*, wxString *path* = *wxEmptyString*)

Reads the controller's setting (position of window, etc.)

wxHtmlHelpController::SetTempDir

void SetTempDir(const wxString& *path*)

Sets the path for storing temporary files - cached binary versions of index and contents files. These binary forms are much faster to read. Default value is empty string (empty string means that no cached data are stored). Note that these files are *not* deleted when program exits.

Once created these cached files will be used in all subsequent executions of your application. If cached files become older than corresponding .hhp file (e.g. if you regenerate documentation) it will be refreshed.

wxHtmlHelpController::SetTitleFormat

void SetTitleFormat(const wxString& *format*)

Sets format of title of the frame. Must contain exactly one "%s" (for title of displayed HTML page).

wxHtmlHelpController::UseConfig

void UseConfig(**wxConfigBase*** *config*, **const wxString&** *rootpath = wxEmptyString*)

Associates *config* object with the controller.

If there is associated config object, wxHtmlHelpController automatically reads and writes settings (including wxHtmlWindow's settings) when needed.

The only thing you must do is create wxConfig object and call UseConfig.

If you do not use *UseConfig*, wxHtmlHelpController will use default wxConfig object if available (for details see *wxConfigBase::Get* (p. 171) and *wxConfigBase::Set* (p. 175)).

wxHtmlHelpController::WriteCustomization

void WriteCustomization(**wxConfigBase*** *cfg*, **wxString** *path = wxEmptyString*)

Stores controllers setting (position of window etc.)

wxHtmlHelpData

This class is used by *wxHtmlHelpController* (p. 522) and *wxHtmlHelpFrame* (p. 528) to access HTML help items. It is internal class and should not be used directly - except for the case you're writing your own HTML help controller.

Derived from

wxObject (p. 750)

Include files

<wx/html/helpdata.h>

wxHtmlHelpData::wxHtmlHelpData

 wxHtmlHelpData()

Constructor.

wxHtmlHelpData::AddBook

bool AddBook(**const wxString&** *book*)

Adds new book. 'book' is location of HTML help project (hhp) or ZIP file that contains arbitrary number of .hhp projects (this zip file can have either .zip or .htb extension, htb stands for "html book"). Returns success.

wxHtmlHelpData::FindPageById

wxString FindPageById(**int** *id*)

Returns page's URL based on integer ID stored in project.

wxHtmlHelpData::FindPageByName

wxString FindPageByName(**const wxString&** *page*)

Returns page's URL based on its (file)name.

wxHtmlHelpData::GetBookRecArray

const wxHtmlBookRecArray& GetBookRecArray()

Returns array with help books info.

wxHtmlHelpData::GetContents

wxHtmlContentsItem* GetContents()

Returns contents lists pointer.

wxHtmlHelpData::GetContentsCnt

int GetContentsCnt()

Returns size of contents list.

wxHtmlHelpData::GetIndex

wxHtmlContentsItem* GetIndex()

Returns pointer to index items list.

wxHtmlHelpData::GetIndexCnt

int GetIndexCnt()

Returns size of index list.

wxHtmlHelpData::SetTempDir

void SetTempDir(const wxString& *path*)

Sets temporary directory where binary cached versions of MS HTML Workshop files will be stored. (This is turned off by default and you can enable this feature by setting non-empty temp dir.)

wxHtmlHelpFrame

This class is used by *wxHtmlHelpController* (p. 522) to display help. It is an internal class and should not be used directly - except for the case when you're writing your own HTML help controller.

Derived from

wxFrame (p. 454)

Include files

<wx/html/helpfrm.h>

wxHtmlHelpFrame::wxHtmlHelpFrame

wxHtmlHelpFrame (wxHtmlHelpData* *data* = *NULL*)

wxHtmlHelpFrame (wxWindow* *parent*, int *wxWindowID*, const wxString& *title* = *wxEmptyString*, int *style* = *wxHF_DEFAULTSTYLE*, wxHtmlHelpData* *data* = *NULL*)

Constructor.

style is combination of these flags:

wxHF_TOOLBAR	Help frame has toolbar.
wxHF_FLATTOOLBAR	Help frame has toolbar with flat buttons (aka coolbar).
wxHF_CONTENTS	Help frame has contents panel.
wxHF_INDEX	Help frame has index panel.
wxHF_SEARCH	Help frame has search panel.
wxHF_BOOKMARKS	Help frame has bookmarks controls.
wxHF_OPENFILES	Allow user to open arbitrary HTML document.
wxHF_PRINT	Toolbar contains "print" button.

wxHtmlHelpFrame::Create

bool Create (**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title* = *wxEmptyString*, **int** *style* = *wxHF_DEFAULTSTYLE*)

Creates the frame.

style is combination of these flags:

wxHF_TOOLBAR	Help frame has toolbar.
wxHF_FLATTOOLBAR	Help frame has toolbar with flat buttons (aka coolbar).
wxHF_CONTENTS	Help frame has contents panel.
wxHF_INDEX	Help frame has index panel.
wxHF_SEARCH	Help frame has search panel.
wxHF_BOOKMARKS	Help frame has bookmarks controls.
wxHF_OPENFILES	Allow user to open arbitrary HTML document.
wxHF_PRINT	Toolbar contains "print" button.

wxHtmlHelpFrame::CreateContents

void CreateContents(**bool** *show_progress* = *FALSE*)

Creates contents panel. (May take some time.)

wxHtmlHelpFrame::CreateIndex

void CreateIndex(**bool** *show_progress* = *FALSE*)

Creates index panel. (May take some time.)

wxHtmlHelpFrame::CreateSearch

void CreateSearch()

Creates search panel.

wxHtmlHelpFrame::Display

bool Display(**const wxString&** *x*)

bool Display(**const int** *id*)

Displays page x. If not found it will give the user the choice of searching books. Looking for the page runs in these steps:

1. try to locate file named x (if x is for example "doc/howto.htm")
2. try to open starting page of book x
3. try to find x in contents (if x is for example "How To ...")
4. try to find x in index (if x is for example "How To ...")

The second form takes numeric ID as the parameter. (uses extension to MS format, <param name="ID" value=id>)

wxPython note: The second form of this method is named DisplayId in wxPython.

wxHtmlHelpFrame::DisplayContents

bool DisplayContents()

Displays contents panel.

wxHtmlHelpFrame::DisplayIndex

bool DisplayIndex()

Displays index panel.

wxHtmlHelpFrame::GetData

wxHtmlHelpData* GetData()

Return wxHtmlHelpData object.

wxHtmlHelpFrame::KeywordSearch

bool KeywordSearch(**const wxString&** *keyword*)

Search for given keyword.

wxHtmlHelpFrame::ReadCustomization

void ReadCustomization(**wxConfigBase*** *cfg*, **const wxString&** *path* = *wxEmptyString*)

Reads user's settings for this frame (see *wxHtmlHelpController::ReadCustomization* (p. 525))

wxHtmlHelpFrame::RefreshLists

void RefreshLists(**bool** *show_progress* = *FALSE*)

Refresh all panels. This is necessary if a new book was added.

wxHtmlHelpFrame::SetTitleFormat

void SetTitleFormat(**const wxString&** *format*)

Sets the frame's title format. *format* must contain exactly one "%s" (it will be replaced by the page title).

wxHtmlHelpFrame::UseConfig

void UseConfig(**wxConfigBase*** *config*, **const wxString&** *rootpath* = *wxEmptyString*)

Add books to search choice panel.

wxHtmlHelpFrame::WriteCustomization

void WriteCustomization(**wxConfigBase*** *cfg*, **const wxString&** *path* = *wxEmptyString*)

Saves user's settings for this frame (see *wxHtmlHelpController::WriteCustomization* (p. 526)).

wxHtmlHelpFrame::AddToolbarButtons

virtual void AddToolbarButtons(**wxToolBar** *toolBar, **int** *style*)

You may override this virtual method to add more buttons into help frame's toolbar. *toolBar* is a pointer to the toolbar and *style* is the style flag as passed to Create method.

wxToolBar::Realize is called immediately after returning from this function.

See *samples/html/helpview* for an example.

wxHtmlLinkInfo

This class stores all neccessary information about hypertext links (as represented by <A> tag in HTML documents). In current implementation it stores URL and target frame name. *Note that frames are not currently supported by wxHTML!*

Derived from

wxObject (p. 750)

Include files

<wx/html/htmlcell.h>

wxHtmlLinkInfo::wxHtmlLinkInfo

wxHtmlLinkInfo()

Default ctor.

wxHtmlLinkInfo(**const wxString&** *href*, **const wxString&** *target = wxEmptyString*)

Construct hypertext link from HREF (aka URL) and TARGET (name of target frame).

wxHtmlLinkInfo::GetEvent

const wxMouseEvent * GetEvent()

Return pointer to event that generated OnLinkClicked event. Valid only within *wxHtmlWindow::OnLinkClicked* (p. 548), NULL otherwise.

wxHtmlLinkInfo::GetHtmlCell

const wxHtmlCell * GetHtmlCell()

Return pointer to the cell that was clicked. Valid only within *wxHtmlWindow::OnLinkClicked* (p. 548), NULL otherwise.

wxHtmlLinkInfo::GetHref

wxString GetHref()

Return *HREF* value of the `<A>` tag.

wxHtmlLinkInfo::GetTarget

wxString GetTarget()

Return *TARGET* value of the `<A>` tag (this value is used to specify in which frame should be the page pointed by *Href* (p. 533) opened).

wxHtmlParser

This class handles the **generic** parsing of HTML document: it scans the document and divide it into blocks of tags (where one block consists of begining and ending tag and of text between these two tags).

It is independent from wxHtmlWindow and can be used as stand-alone parser (Julian Smart's idea of speech-only HTML viewer or wget-like utility - see InetGet sample for example).

It uses system of tag handlers to parse the HTML document. Tag handlers are not staticaly shared by all instances but are created for each wxHtmlParser instance. The reason is that the handler may contain document-specific temporary data used during parsing (e.g. complicated structures like tables).

Typically the user calls only the *Parse* (p. 535) method.

Derived from

wxObject

Include files

<wx/html/htmlpars.h>

See also

Cells Overview (p. 1445), *Tag Handlers Overview* (p. 1447), *wxHtmlTag* (p. 539)

wxHtmlParser::wxHtmlParser

 wxHtmlParser()

Constructor.

wxHtmlParser::AddTag

void AddTag(**const wxHtmlTag&** *tag*)

This may (and may not) be overwriten in derived class.

This method is called each time new tag is about to be added. *tag* contains information about the tag. (See *wxHtmlTag* (p. 539)for details.)

Default (wxHtmlParser) behaviour is this: First it finds a handler capable of handling this tag and then it calls handler's HandleTag method.

wxHtmlParser::AddTagHandler

virtual void AddTagHandler(**wxHtmlTagHandler** **handler*)

Adds handler to the internal list (& hash table) of handlers. This method should not be called directly by user but rather by derived class' constructor.

This adds the handler to this **instance** of wxHtmlParser, not to all objects of this class! (Static front-end to AddTagHandler is provided by wxHtmlWinParser).

All handlers are deleted on object deletion.

wxHtmlParser::AddText

virtual void AddWord(**const char*** *txt*)

Must be overwriten in derived class.

This method is called by *DoParsing* (p. 534)each time a part of text is parsed. *txt* is NOT only one word, it is substring of input. It is not formatted or preprocessed (so white spaces are unmodified).

wxHtmlParser::DoParsing

void DoParsing(**int** *begin_pos*, **int** *end_pos*)

void DoParsing()

Parses the m_Source from begin_pos to end_pos-1. (in noparams version it parses

whole m_Source)

wxHtmlParser::DoneParser

virtual void DoneParser()

This must be called after DoParsing().

wxHtmlParser::GetFS

wxFileSystem* GetFS() const

Returns pointer to the file system. Because each tag handler has reference to it is parent parser it can easily request the file by calling

```
wxFSFile *f = m_Parser -> GetFS() -> OpenFile("image.jpg");
```

wxHtmlParser::GetProduct

virtual wxObject* GetProduct()

Returns product of parsing. Returned value is result of parsing of the document. The type of this result depends on internal representation in derived parser (but it must be derived from wxObject!).

See wxHtmlWinParser for details.

wxHtmlParser::GetSource

wxString* GetSource ()

Returns pointer to the source being parsed.

wxHtmlParser::InitParser

virtual void InitParser(const wxString& *source*)

Setups the parser for parsing the *source* string. (Should be overridden in derived class)

wxHtmlParser::Parse

wxObject* Parse (const wxString& *source*)

Proceeds parsing of the document. This is end-user method. You can simply call it when

you need to obtain parsed output (which is parser-specific)

The method does these things:

1. calls *InitParser(source)* (p. 535)
2. calls *DoParsing* (p. 534)
3. calls *GetProduct* (p. 535)
4. calls *DoneParser* (p. 535)
5. returns value returned by GetProduct

You shouldn't use InitParser, DoParsing, GetProduct or DoneParser directly.

wxHtmlParser::PushTagHandler

void PushTagHandler(**wxHtmlTagHandler*** *handler*, **wxString** *tags*)

Forces the handler to handle additional tags (not returned by *GetSupportedTags* (p. 543)). The handler should already be added to this parser.

Parameters

handler
    the handler
tags
    List of tags (in same format as GetSupportedTags's return value). The parser will redirect these tags to *handler* (until call to *PopTagHandler* (p. 537)).

Example

Imagine you want to parse following pseudo-html structure:

```
<myitems>
    <param name="one" value="1">
    <param name="two" value="2">
</myitems>

<execute>
    <param program="text.exe">
</execute>
```

It is obvious that you cannot use only one tag handler for <param> tag. Instead you must use context-sensitive handlers for <param> inside <myitems> and <param> inside <execute>.

This is the preferred solution:

```
TAG_HANDLER_BEGIN(MYITEM, "MYITEMS")
    TAG_HANDLER_PROC(tag)
    {
        // ...something...
```

```
        m_Parser -> PushTagHandler(this, "PARAM");
        ParseInner(tag);
        m_Parser -> PopTagHandler();

        // ...something...
    }
TAG_HANDLER_END(MYITEM)
```

wxHtmlParser::PopTagHandler

void PopTagHandler()

Restores parser's state before last call to *PushTagHandler* (p. 536).

wxHtmlParser::SetFS

void SetFS(wxFileSystem *fs*)

Sets the virtual file system that will be used to request additional files. (For example `<IMG>` tag handler requests wxFSFile with the image data.)

wxHtmlPrintout

This class serves as printout class for HTML documents.

Derived from

wxPrintout (p. 811)

Include files

<wx/html/htmprint.h>

wxHtmlPrintout::wxHtmlPrintout

wxHtmlPrintout(const wxString& *title = "Printout"*)

Constructor.

wxHtmlPrintout::SetFooter

void SetFooter(**const wxString&** *footer*, **int** *pg = wxPAGE_ALL*)

Sets page footer.

Parameters

footer
> HTML text to be used as footer. You can use macros in it:
> - @PAGENUM@ is replaced by page number
>
> - @PAGESCNT@ is replaced by total number of pages

pg
> one of wxPAGE_ODD, wxPAGE_EVEN and wxPAGE_ALL constants.

wxHtmlPrintout::SetHeader

void SetHeader(**const wxString&** *header*, **int** *pg = wxPAGE_ALL*)

Sets page header.

Parameters

header
> HTML text to be used as header. You can use macros in it:
> - @PAGENUM@ is replaced by page number
>
> - @PAGESCNT@ is replaced by total number of pages

pg
> one of wxPAGE_ODD, wxPAGE_EVEN and wxPAGE_ALL constants.

wxHtmlPrintout::SetHtmlFile

void SetHtmlFile(**const wxString&** *htmlfile*)

Prepare the class for printing this HTML **file**. The file may be located on any virtual file system or it may be normal file.

wxHtmlPrintout::SetHtmlText

void SetHtmlText(**const wxString&** *html*, **const wxString&** *basepath = wxEmptyString*, **bool** *isdir = TRUE*)

Prepare the class for printing this HTML text.

Parameters

html

    HTML text. (NOT file!)

basepath

    base directory (html string would be stored there if it was in file). It is used to determine path for loading images, for example.

isdir

    FALSE if basepath is filename, TRUE if it is directory name (see *wxFileSystem* (p. 425) for detailed explanation)

wxHtmlPrintout::SetMargins

void SetMargins(**float** *top = 25.2*, **float** *bottom = 25.2*, **float** *left = 25.2*, **float** *right = 25.2*, **float** *spaces = 5*)

Sets margins in milimeters. Defaults to 1 inch for margins and 0.5cm for space between text and header and/or footer

wxHtmlTag

This class represents a single HTML tag. It is used by *tag handlers* (p. 1447).

Derived from

wxObject

Include files

<wx/html/htmltag.h>

wxHtmlTag::wxHtmlTag

 wxHtmlTag(**const wxString&** *source*, **int** *pos*, **int** *end_pos*, **wxHtmlTagsCache*** *cache*)

Constructor. You will probably never have to construct a wxHtmlTag object yourself. Feel free to ignore the constructor parameters. Have a look at lib/htmlparser.cpp if you're interested in creating it.

wxHtmlTag::GetAllParams

const wxString& GetAllParams() **const**

Returns string with all params.

Example : tag contains `<FONT SIZE=+2 COLOR="#000000">`. Call to
tag.GetAllParams() would return `SIZE=+2 COLOR="#000000"`.

wxHtmlTag::GetBeginPos

int GetBeginPos() **const**

Returns beginning position of the text *between* this tag and paired ending tag. See
explanation (returned position is marked with '|'):

```
bla bla bla <MYTAG> bla bla intenal text</MYTAG> bla bla
                |
```

wxHtmlTag::GetEndPos1

int GetEndPos1() **const**

Returns ending position of the text *between* this tag and paired ending tag. See
explanation (returned position is marked with '|'):

```
bla bla bla <MYTAG> bla bla intenal text</MYTAG> bla bla
                                         |
```

wxHtmlTag::GetEndPos2

int GetEndPos2() **const**

Returns ending position 2 of the text *between* this tag and paired ending tag. See
explanation (returned position is marked with '|'):

```
bla bla bla <MYTAG> bla bla intenal text</MYTAG> bla bla
                                               |
```

wxHtmlTag::GetName

wxString GetName() **const**

Returns tag's name. The name is always in uppercase and it doesn't contain '<' or '/'
characters. (So the name of `<FONT SIZE=+2>` tag is "FONT" and name of `</table>`
is "TABLE")

wxHtmlTag::GetParam

wxString GetParam(**const wxString&** *par*, **bool** *with_commas = FALSE*) **const**

Retuns the value of the parameter. You should check whether the param exists or not (use *HasParam* (p. 541)) first.

Parameters

par
> The parameter's name in uppercase

with_commas
> TRUE if you want to get commas as well. See example.

Example

```
...
/* you have wxHtmlTag variable tag which is equal to
   HTML tag <FONT SIZE=+2 COLOR="#0000FF"> */
dummy = tag.GetParam("SIZE");
   // dummy == "+2"
dummy = tag.GetParam("COLOR");
   // dummy == "#0000FF"
dummy = tag.GetParam("COLOR", TRUE);
   // dummy == "\"#0000FF\"" -- see the difference!!
```

wxHtmlTag::HasEnding

bool HasEnding() **const**

Returns TRUE if this tag is paired with ending tag, FALSE otherwise.

See the example of HTML document:

```
<html><body>
Hello<p>
How are you?
<p align=center>This is centered...</p>
Oops<br>Oooops!
</body></html>
```

In this example tags HTML and BODY have ending tags, first P and BR doesn't have ending tag while the second P has. The third P tag (which is ending itself) of course doesn't have ending tag.

wxHtmlTag::HasParam

bool HasParam(**const wxString&** *par*) **const**

Returns TRUE if the tag has parameter of the given name. Example : `<FONT SIZE=+2 COLOR="#FF00FF">` has two parameters named "SIZE" and "COLOR".

Parameters

par
> the parameter you're looking for. It must *always* be in uppercase!

wxHtmlTag::IsEnding

bool IsEnding() const

Returns TRUE if this tag is ending one. (`</FONT>` is ending tag, `<FONT>` is not)

wxHtmlTag::ScanParam

wxString ScanParam(const wxString& *par*, const char **format*, fuck) const

This method scans given parameter. Usage is exactly the same as sscanf's usage except that you don't pass string but param name as the first parameter.

Parameters

par
> The name of tag you want to query (in uppercase)

format
> scanf()-like format string.

Cygwin and Mingw32

If you're using Cygwin beta 20 or Mingw32 compiler please remember that ScanParam() is only partially implemented! The problem is that under Cygnus' GCC vsscanf() function is not implemented. I worked around this in a way which causes that you can use only one parameter in ... (and only one % in *format*).

wxHtmlTagHandler

Derived from

wxObject (p. 750)

Include files

<wx/html/htmlpars.h>

wxHtmlTagHandler::m_Parser

wxHtmlParser* m_Parser

This attribute is used to access parent parser. It is protected so that it can't be accessed by user but can be accessed from derived classes.

wxHtmlTagHandler::wxHtmlTagHandler

wxHtmlTagHandler()

Constructor.

wxHtmlTagHandler::GetSupportedTags

virtual wxString GetSupportedTags()

Returns list of supported tags. The list is in uppercase and tags are delimited by ','.
Example : `"I,B,FONT,P"`

wxHtmlTagHandler::HandleTag

virtual bool HandleTag(**const wxHtmlTag&** *tag*)

This is the core method of each handler. It is called each time one of supported tags is detected. *tag* contains all neccessary info (see *wxHtmlTag* (p. 539) for details).

Return value

TRUE if *ParseInner* (p. 544) was called, FALSE otherwise.

Example

```
bool MyHandler::HandleTag(const wxHtmlTag& tag)
{
    ...
    // change state of parser (e.g. set bold face)
    ParseInner(tag);
```

```
    ...
    // restore original state of parser
}
```

You shouldn't call ParseInner if the tag is not paired with ending one.

wxHtmlTagHandler::ParseInner

void ParseInner(const wxHtmlTag& *tag*)

This method calls parser's *DoParsing* (p. 534) method for the string between this tag and paired ending tag:

```
...<A HREF="x.htm">Hello, world!</A>...
```

In this example, a call to ParseInner (with *tag* pointing to A tag) will parse 'Hello, world!'.

wxHtmlTagHandler::SetParser

virtual void SetParser(wxHtmlParser **parser*)

Assigns *parser* to this handler. Each **instance** of handler is guaranteed to be called only from the parser.

wxHtmlTagsModule

This class provides easy way of filling wxHtmlWinParser's table of tag handlers. It is used almost exclusively together with set of *TAGS_MODULE_* macros* (p. 1447)

Derived from

wxModule (p. 723)

Include files

<wx/html/winpars.h>

See Also

Tag Handlers (p. 1447), *wxHtmlTagHandler* (p. 542), *wxHtmlWinTagHandler* (p. 558),

wxHtmlTagsModule::FillHandlersTable

virtual void FillHandlersTable(**wxHtmlWinParser** **parser*)

You must override this method. In most common case it is body consists only of lines of following type:

```
parser -> AddTagHandler(new MyHandler);
```

I recommend using **TAGS_MODULE_*** macros.

Paremeters

parser
Pointer to the parser that requested tables filling.

wxHtmlWidgetCell

wxHtmlWidgetCell is a class that provides a connection between HTML cells and widgets (an object derived from wxWindow). You can use it to display things like forms, input boxes etc. in an HTML window.

wxHtmlWidgetCell takes care of resizing and moving window.

Derived from

wxHtmlCell (p. 503)

Include files

<wx/html/htmlcell.h>

wxHtmlWidgetCell::wxHtmlWidgetCell

wxHtmlWidgetCell(**wxWindow*** *wnd*, **int** *w = 0*)

Constructor.

Parameters

wnd
Connected window. It is parent window **must** be the wxHtmlWindow object within which it is displayed!

w

Floating width. If non-zero width of *wnd* window is adjusted so that it is always *w* percents of parent container's width. (For example w = 100 means that the window will always have same width as parent container)

wxHtmlWindow

wxHtmlWindow is probably the only class you will directly use unless you want to do something special (like adding new tag handlers or MIME filters).

The purpose of this class is to display HTML pages (either local file or downloaded via HTTP protocol) in a window. The width of the window is constant - given in the constructor - and virtual height is changed dynamically depending on page size. Once the window is created you can set its content by calling *SetPage(text)* (p. 551) or *LoadPage(filename)* (p. 548).

Derived from

wxScrolledWindow (p. 916)

Include files

<wx/html/htmlwin.h>

wxHtmlWindow::wxHtmlWindow

wxHtmlWindow()

Default constructor.

wxHtmlWindow(**wxWindow** **parent*, **wxWindowID** *id = -1*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxHW_SCROLLBAR_AUTO*, **const wxString&** *name = "htmlWindow"*)

Constructor. The parameters are the same as for the *wxScrolledWindow* (p. 916) constructor.

Parameters

style
    wxHW_SCROLLBAR_NEVER, or wxHW_SCROLLBAR_AUTO. Affects the appearance of vertical scrollbar in the window.

wxHtmlWindow::AddFilter

static void AddFilter(**wxHtmlFilter** **filter*)

Adds *input filter* (p. 1445) to the static list of available filters. These filters are present by default:

- `text/html` MIME type
- `image/*` MIME types
- Plain Text filter (this filter is used if no other filter matches)

wxHtmlWindow::GetInternalRepresentation

wxHtmlContainerCell* GetInternalRepresentation() const

Returns pointer to the top-level container.

See also: *Cells Overview* (p. 1445), *Printing Overview* (p. 1443)

wxHtmlWindow::GetOpenedAnchor

wxString GetOpenedAnchor()

Returns anchor within currently opened page (see *GetOpenedPage* (p. 547)). If no page is opened or if the displayed page wasn't produced by call to LoadPage, empty string is returned.

wxHtmlWindow::GetOpenedPage

wxString GetOpenedPage()

Returns full location of the opened page. If no page is opened or if the displayed page wasn't produced by call to LoadPage, empty string is returned.

wxHtmlWindow::GetOpenedPageTitle

wxString GetOpenedPageTitle()

Returns title of the opened page or wxEmptyString if current page does not contain `<TITLE>` tag.

wxHtmlWindow::GetRelatedFrame

wxFrame* GetRelatedFrame() const

Returns the related frame.

wxHtmlWindow::HistoryBack

bool HistoryBack()

Moves back to the previous page. (each page displayed using *LoadPage* (p. 548) is stored in history list.)

wxHtmlWindow::HistoryClear

void HistoryClear()

Clears history.

wxHtmlWindow::HistoryForward

bool HistoryForward()

Moves to next page in history.

wxHtmlWindow::LoadPage

bool LoadPage(**const wxString&** *location*)

Unlike SetPage this function first loads HTML page from *location* and then displays it. See example:

```
htmlwin -> SetPage("help/myproject/index.htm");
```

Parameters

location
    The address of document. See *wxFileSystem* (p. 425) for details on address format and behaviour of "opener".

Return value

FALSE if an error occurred, TRUE otherwise

wxHtmlWindow::OnLinkClicked

virtual void OnLinkClicked(**const wxHtmlLinkInfo&** *link*)

Called when user clicks on hypertext link. Default behaviour is to call *LoadPage* (p. 548) and do nothing else.

Also see *wxHtmlLinkInfo* (p. 532).

wxHtmlWindow::OnSetTitle

virtual void OnSetTitle(**const wxString&** *title*)

Called on parsing `<TITLE>` tag.

wxHtmlWindow::ReadCustomization

virtual void ReadCustomization(**wxConfigBase** **cfg*, **wxString** *path* = *wxEmptyString*)

This reads custom settings from wxConfig. It uses the path 'path' if given, otherwise it saves info into currently selected path. The values are stored in sub-path `wxHtmlWindow`

Read values: all things set by SetFonts, SetBorders.

Parameters

cfg
    wxConfig from which you want to read the configuration.

path
    Optional path in config tree. If not given current path is used.

wxHtmlWindow::SetBorders

void SetBorders(**int** *b*)

This function sets the space between border of window and HTML contents. See image:
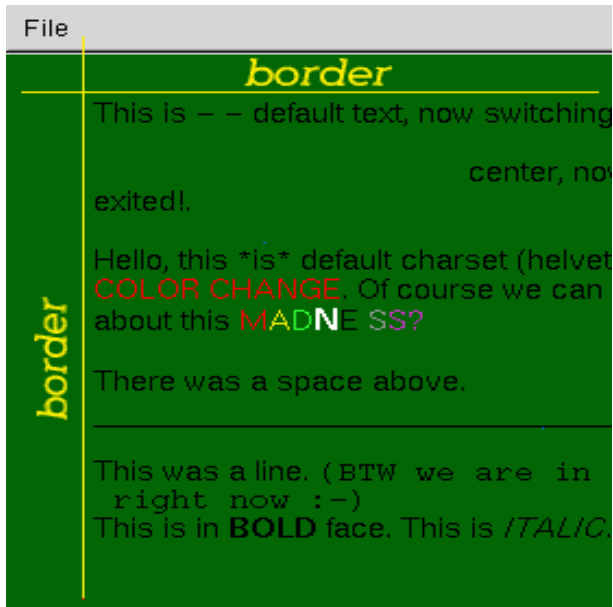
Parameters

b

    indentation from borders in pixels

wxHtmlWindow::SetFonts

void SetFonts(**wxString** *normal_face*, **wxString** *fixed_face*, **const int** **sizes*)

This function sets font sizes and faces.

Parameters

normal_face

    This is face name for normal (i.e. non-fixed) font. It can be either empty string
    (then the default face is choosen) or platform-specific face name. Examples are
    "helvetica" under Unix or "Times New Roman" under Windows.

fixed_face

    The same thing for fixed face (<TT>..</TT>)

sizes

    This is an array of 7 items of *int* type. The values represent size of font with HTML
    size from -2 to +4 (<FONT SIZE=-2> to <FONT SIZE=+4>)

Defaults

Under wxGTK:

```
SetFonts("", "", {10, 12, 14, 16, 19, 24, 32});
```

Under Windows:

```
SetFonts("", "", {7, 8, 10, 12, 16, 22, 30});
```

Athough it seems different the fact is that the fonts are of approximately same size under both platforms (due to wxMSW / wxGTK inconsistency)

wxHtmlWindow::SetPage

bool SetPage (**const wxString&** *source*)

Sets HTML page and display it. This won't **load** the page!! It will display the *source*. See example:

```
htmlwin -> SetPage("<html><body>Hello, world!</body></html>");
```

If you want to load a document from some location use *LoadPage* (p. 548) instead.

Parameters

source
> The HTML document source to be displayed.

Return value

FALSE if an error occurred, TRUE otherwise.

wxHtmlWindow::SetRelatedFrame

void SetRelatedFrame (**wxFrame*** *frame*, **const wxString&** *format*)

Sets the frame in which page title will be displayed. *format* is format of frame title, e.g. "HtmlHelp : %s". It must contain exactly one %s. This%s is substituted with HTML page title.

wxHtmlWindow::SetRelatedStatusBar

void SetRelatedStatusBar (**int** *bar*)

After calling *SetRelatedFrame* (p. 551), this sets statusbar slot where messages will be displayed. (Default is -1 = no messages.)

Parameters

bar
> statusbar slot number (0..n)

wxHtmlWindow::WriteCustomization

virtual void WriteCustomization(**wxConfigBase** **cfg*, **wxString** *path = wxEmptyString*)

Saves custom settings into wxConfig. It uses the path 'path' if given, otherwise it saves info into currently selected path. Regardless of whether the path is given or not, the function creates sub-path `wxHtmlWindow`.

Saved values: all things set by SetFonts, SetBorders.

Parameters

cfg
    wxConfig to which you want to save the configuration.

path
    Optional path in config tree. If not given, the current path is used.

wxHtmlWinParser

This class is derived from *wxHtmlParser* (p. 533) and its mail goal is to parse HTML input so that it can be displayed in *wxHtmlWindow* (p. 546). It uses a special *wxHtmlWinTagHandler* (p. 558).

Notes

The product of parsing is a wxHtmlCell (resp. wxHtmlContainer) object.

Derived from

wxHtmlParser (p. 533)

Include files

<wx/html/winpars.h>

See Also

Handlers overview (p. 1447)

wxHtmlWinParser::wxHtmlWinParser

wxHtmlWinParser()

wxHtmlWinParser(**wxWindow** **wnd*)

Constructor. Don't use the default one, use constructor with *wnd* paremeter (*wnd* is pointer to associated *wxHtmlWindow* (p. 546))

wxHtmlWinParser::AddModule

static void AddModule(**wxHtmlTagsModule** **module*)

Adds *module* (p. 1447) to the list of wxHtmlWinParser tag handler.

wxHtmlWinParser::CloseContainer

wxHtmlContainerCell* CloseContainer()

Closes the container, sets actual container to the parent one and returns pointer to it (see *Overview* (p. 1445)).

wxHtmlWinParser::CreateCurrentFont

virtual wxFont* CreateCurrentFont()

Creates font based on current setting (see *SetFontSize* (p. 557), *SetFontBold* (p. 557), *SetFontItalic* (p. 557), *SetFontFixed* (p. 557), *SetFontUnderlined* (p. 558)) and returns pointer to it. If the font was already created only a pointer is returned.

wxHtmlWinParser::GetActualColor

const wxColour& GetActualColor() **const**

Returns actual text colour.

wxHtmlWinParser::GetAlign

int GetAlign() **const**

Returns default horizontal alignment.

wxHtmlWinParser::GetCharHeight

int GetCharHeight() **const**

Returns (average) char height in standard font. It is used as DC-independent metrics.

Note: This function doesn't return the *actual* height. If you want to know the height of the current font, call `GetDC -> GetCharHeight().`

wxHtmlWinParser::GetCharWidth

int GetCharWidth() **const**

Returns average char width in standard font. It is used as DC-independent metrics.

Note: This function doesn't return the *actual* width. If you want to know the height of the current font, call `GetDC -> GetCharWidth()`

wxHtmlWinParser::GetContainer

wxHtmlContainerCell* GetContainer() **const**

Returns pointer to the currently opened container (see *Overview* (p. 1445)). Common use:

`m_WParser -> GetContainer() -> InsertCell(new ...);`

wxHtmlWinParser::GetDC

wxDC* GetDC()

Returns pointer to the DC used during parsing.

wxHtmlWinParser::GetEncodingConverter

wxEncodingConverter * GetEncodingConverter() **const**

Returns *wxEncodingConverter* (p. 373) class used to do conversion between *input encoding* (p. 555) and *output encoding* (p. 556).

wxHtmlWinParser::GetFontBold

int GetFontBold() **const**

Returns TRUE if actual font is bold, FALSE otherwise.

wxHtmlWinParser::GetFontFace

wxString GetFontFace() **const**

Returns actual font face name.

wxHtmlWinParser::GetFontFixed

int GetFontFixed() **const**

Returns TRUE if actual font is fixed face, FALSE otherwise.

wxHtmlWinParser::GetFontItalic

int GetFontItalic() **const**

Returns TRUE if actual font is italic, FALSE otherwise.

wxHtmlWinParser::GetFontSize

int GetFontSize() **const**

Returns actual font size (HTML size varies from -2 to +4)

wxHtmlWinParser::GetFontUnderlined

int GetFontUnderlined() **const**

Returns TRUE if actual font is underlined, FALSE otherwise.

wxHtmlWinParser::GetInputEncoding

wxFontEncoding GetInputEncoding() **const**

Returns input encoding.

wxHtmlWinParser::GetLink

const wxHtmlLinkInfo& GetLink() **const**

Returns actual hypertext link. (This value has a non-empty *Href* (p. 533) string if the parser is between `<A>` and `</A>` tags, wxEmptyString otherwise.)

wxHtmlWinParser::GetLinkColor

const wxColour& GetLinkColor() const

Returns the colour of hypertext link text.

wxHtmlWinParser::GetOutputEncoding

wxFontEncoding GetOutputEncoding() const

Returns output encoding, i.e. closest match to document's input encoding that is supported by operating system.

wxHtmlWinParser::GetWindow

wxWindow* GetWindow()

Returns associated window (wxHtmlWindow). This may be NULL! (You should always test if it is non-NULL. For example TITLE handler sets window title only if some window is associated, otherwise it does nothing)

wxHtmlWinParser::OpenContainer

wxHtmlContainerCell* OpenContainer()

Opens new container and returns pointer to it (see *Overview* (p. 1445)).

wxHtmlWinParser::SetActualColor

void SetActualColor(const wxColour& *clr*)

Sets actual text colour. Note: this DOESN'T change the colour! You must create *wxHtmlColourCell* (p. 509) yourself.

wxHtmlWinParser::SetAlign

void SetAlign(int *a*)

Sets default horizontal alignment (see *wxHtmlContainerCell::SetAlignHor* (p. 511).) Alignment of newly opened container is set to this value.

wxHtmlWinParser::SetContainer

wxHtmlContainerCell* SetContainer(**wxHtmlContainerCell ****c*)

Allows you to directly set opened container. This is not recommended - you should use OpenContainer wherever possible.

wxHtmlWinParser::SetDC

virtual void SetDC(**wxDC** **dc*, **double** *pixel_scale = 1.0*)

Sets the DC. This must be called before *Parse* (p. 535)! *pixel_scale* can be used when rendering to high-resolution DCs (e.g. printer) to adjust size of pixel metrics. (Many dimensions in HTML are given in pixels -- e.g. image sizes. 300x300 image would be only one inch wide on typical printer. With pixel_scale = 3.0 it would be 3 inches.)

wxHtmlWinParser::SetFontBold

void SetFontBold(**int** *x*)

Sets bold flag of actualfont. *x* is either TRUE of FALSE.

wxHtmlWinParser::SetFontFace

void SetFontFace(**const wxString&** *face*)

Sets current font face to *face*. This affects either fixed size font or proportional, depending on context (whether the parser is inside <TT> tag or not).

wxHtmlWinParser::SetFontFixed

void SetFontFixed(**int** *x*)

Sets fixed face flag of actualfont. *x* is either TRUE of FALSE.

wxHtmlWinParser::SetFontItalic

void SetFontItalic(**int** *x*)

Sets italic flag of actualfont. *x* is either TRUE of FALSE.

wxHtmlWinParser::SetFontSize

void SetFontSize(**int** *s*)

Sets actual font size (HTML size varies from 1 to 7)

wxHtmlWinParser::SetFontUnderlined

void SetFontUnderlined(**int** *x*)

Sets underlined flag of actualfont. *x* is either TRUE of FALSE.

wxHtmlWinParser::SetFonts

void SetFonts(**wxString** *normal_face*, **wxString** *fixed_face*, **const int** **sizes*)

Sets fonts. This method is identical to *wxHtmlWindow::SetFonts* (p. 550)

wxHtmlWinParser::SetInputEncoding

void SetInputEncoding(**wxFontEncoding** *enc*)

Sets input encoding. The parser uses this information to build conversion tables from document's encoding to some encoding supported by operating system.

wxHtmlWinParser::SetLink

void SetLink(**const wxHtmlLinkInfo&** *link*)

Sets actual hypertext link. Empty link is represented by *wxHtmlLinkInfo* (p. 532) with *Href* equal to wxEmptyString.

wxHtmlWinParser::SetLinkColor

void SetLinkColor(**const wxColour&** *clr*)

Sets colour of hypertext link.

wxHtmlWinTagHandler

This is basically wxHtmlTagHandler except that it is extended with protected member m_WParser pointing to the wxHtmlWinParser object (value of this member is identical to wxHtmlParser's m_Parser).

Derived from

wxHtmlTagHandler (p. 542)

Include files

<wx/html/winpars.h>

wxHtmlWinTagHandler::m_WParser

wxHtmlWinParser* m_WParser

Value of this attribute is identical to value of m_Parser. The only different is that
m_WParser points to wxHtmlWinParser object while m_Parser points to wxHtmlParser
object. (The same object, but overcast.)

wxHTTP

Derived from

wxProtocol (p. 853)

Include files

<wx/protocol/http.h>

See also

wxSocketBase (p. 943), *wxURL* (p. 1169)

wxHTTP::GetInputStream

wxInputStream * GetInputStream(const wxString& *path*)

Creates a new input stream on the the specified path. You can use all except the seek
functionality of wxStream. Seek isn't available on all streams. For example, http or ftp
streams doesn't deal with it. Other functions like Tell and SeekI for this sort of stream.
You will be notified when the EOF is reached by an error.

Note

You can know the size of the file you are getting using *wxStreamBase::GetSize()* (p.
1005). But there is a limitation: as HTTP servers aren't obliged to pass the size ofi the
file, in some case, you will be returned 0xffffffff by GetSize(). In these cases, you should

use the value returned by *wxInputStream::LastRead()* (p. 596): this value will be 0 when the stream is finished.

Return value

Returns the initialized stream. You will have to delete it yourself once you don't use it anymore. The destructor closes the network connection. The next time you will try to get a file the network connection will have to be reestablished: but you don't have to take care of this wxHTTP reestablishes it automatically.

See also

wxInputStream (p. 595)

wxHTTP::SetHeader

void SetHeader(**const wxString&** *header*, **const wxString&** *h_data*)

It sets data of a field to be sent during the next request to the HTTP server. The field name is specified by *header* and the content by *h_data*. This is a low level function and it assumes that you know what you are doing.

wxHTTP::GetHeader

wxString GetHeader(**const wxString&** *header*)

Returns the data attached with a field whose name is specified by *header*. If the field doesn't exist, it will return an empty string and not a NULL string.

Note

The header is not case-sensitive: I mean that "CONTENT-TYPE" and "content-type" represent the same header.

wxIdleEvent

This class is used for idle events, which are generated when the system is idle.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process an idle event, use this event handler macro to direct input to a member function that takes a wxIdleEvent argument.

EVT_IDLE(func)   Process a wxEVT_IDLE event.

Remarks

Idle events can be caught by the wxApp class, or by top-level window classes.

See also

wxApp::OnIdle (p. 27), *Event handling overview*(p. 1372)

wxIdleEvent::wxIdleEvent

wxIdleEvent()

Constructor.

wxIdleEvent::RequestMore

void RequestMore(**bool** *needMore = TRUE*)

Tells wxWindows that more processing is required. This function can be called by an OnIdle handler for a window or window event handler to indicate that wxApp::OnIdle should forward the OnIdle event once more to the application windows. If no window calls this function during OnIdle, then the application will remain in a passive event loop (not calling OnIdle) until a new event is posted to the application by the windowing system.

See also

wxIdleEvent::MoreRequested (p. 561), *wxApp::OnIdle* (p. 27)

wxIdleEvent::MoreRequested

bool MoreRequested() **const**

Returns TRUE if the OnIdle function processing this event requested more processing time.

See also

wxIdleEvent::RequestMore (p. 561), *wxApp::OnIdle* (p. 27)

wxIcon

An icon is a small rectangular bitmap usually used for denoting a minimized application. It differs from a wxBitmap in always having a mask associated with it for transparent drawing. On some platforms, icons and bitmaps are implemented identically, since there is no real distinction between a wxBitmap with a mask and an icon; and there is no specific icon format on some platforms (X-based applications usually standardize on XPMs for small bitmaps and icons). However, some platforms (such as Windows) make the distinction, so a separate class is provided.

Derived from

wxBitmap (p. 54)
wxGDIObject (p. 477)
wxObject (p. 750)

Include files

<wx/icon.h>

Predefined objects

Objects:

wxNullIcon

Remarks

It is usually desirable to associate a pertinent icon with a frame. Icons can also be used for other purposes, for example with *wxTreeCtrl* (p. 1140) and *wxListCtrl* (p. 634).

Icons have different formats on different platforms. Therefore, separate icons will usually be created for the different environments. Platform-specific methods for creating a **wxIcon** structure are catered for, and this is an occasion where conditional compilation will probably be required.

Note that a new icon must be created for every time the icon is to be used for a new window. In Windows, the icon will not be reloaded if it has already been used. An icon allocated to a frame will be deleted when the frame is deleted.

For more information please see *Bitmap and icon overview* (p. 1397).

See also

Bitmap and icon overview (p. 1397), *supported bitmap file formats* (p. 1398), *wxDC::DrawIcon* (p. 287), *wxCursor* (p. 184)

wxIcon::wxIcon

wxIcon()

Default constructor.

wxIcon(**const wxIcon&** *icon*)

Copy constructor.

wxIcon(**void*** *data*, **int** *type*, **int** *width*, **int** *height*, **int** *depth = -1*)

Creates an icon from the given data, which can be of arbitrary type.

wxIcon(**const char** *bits[]*, **int** *width*, **int** *height*
int *depth = 1*)

Creates an icon from an array of bits.

wxIcon(**int** *width*, **int** *height*, **int** *depth = -1*)

Creates a new icon.

wxIcon(**char**** *bits*)

wxIcon(**const char**** *bits*)

Creates an icon from XPM data.

wxIcon(**const wxString&** *name*, **long** *type*, **int** *desiredWidth = -1*, **int** *desiredHeight = -1*)

Loads an icon from a file or resource.

Parameters

bits
 Specifies an array of pixel values.

width
 Specifies the width of the icon.

height

Specifies the height of the icon.

desiredWidth

Specifies the desired width of the icon. This parameter only has an effect in Windows (32-bit) where icon resources can contain several icons of different sizes.

desiredWidth

Specifies the desired height of the icon. This parameter only has an effect in Windows (32-bit) where icon resources can contain several icons of different sizes.

depth

Specifies the depth of the icon. If this is omitted, the display depth of the screen is used.

name

This can refer to a resource name under MS Windows, or a filename under MS Windows and X. Its meaning is determined by the *flags* parameter.

type

May be one of the following:

wxBITMAP_TYPE_ICO   Load a Windows icon file.
wxBITMAP_TYPE_ICO_RESOURCE Load a Windows icon from the resource
                                         database.
wxBITMAP_TYPE_GIF   Load a GIF bitmap file.
wxBITMAP_TYPE_XBM   Load an X bitmap file.
wxBITMAP_TYPE_XPM   Load an XPM bitmap file.

The validity of these flags depends on the platform and wxWindows configuration. If all possible wxWindows settings are used, the Windows platform supports ICO file, ICO resource, XPM data, and XPM file. Under wxGTK, the available formats are BMP file, XPM data, XPM file, and PNG file. Under wxMotif, the available formats are XBM data, XBM file, XPM data, XPM file.

Remarks

The first form constructs an icon object with no data; an assignment or another member function such as Create or LoadFile must be called subsequently.

The second and third forms provide copy constructors. Note that these do not copy the icon data, but instead a pointer to the data, keeping a reference count. They are therefore very efficient operations.

The fourth form constructs an icon from data whose type and value depends on the value of the *type* argument.

The fifth form constructs a (usually monochrome) icon from an array of pixel values, under both X and Windows.

The sixth form constructs a new icon.

The seventh form constructs an icon from pixmap (XPM) data, if wxWindows has been configured to incorporate this feature.

To use this constructor, you must first include an XPM file. For example, assuming that the file `mybitmap.xpm` contains an XPM array of character pointers called mybitmap:

```
#include "mybitmap.xpm"

...

wxIcon *icon = new wxIcon(mybitmap);
```

A macro, wxICON, is available which creates an icon using an XPM on the appropriate platform, or an icon resource on Windows.

```
wxIcon icon(wxICON(mondrian));

// Equivalent to:

#if defined(__WXGTK__) || defined(__WXMOTIF__)
wxIcon icon(mondrian_xpm);
#endif

#if defined(__WXMSW__)
wxIcon icon("mondrian");
#endif
```

The eighth form constructs an icon from a file or resource. *name* can refer to a resource name under MS Windows, or a filename under MS Windows and X.

Under Windows, *type* defaults to wxBITMAP_TYPE_ICO_RESOURCE. Under X, *type* defaults to wxBITMAP_TYPE_XPM.

See also

wxIcon::LoadFile (p. 566)

wxIcon::~wxIcon

~wxIcon()

Destroys the wxIcon object and possibly the underlying icon data. Because reference counting is used, the icon may not actually be destroyed at this point - only when the reference count is zero will the data be deleted.

If the application omits to delete the icon explicitly, the icon will be destroyed automatically by wxWindows when the application exits.

Do not delete an icon that is selected into a memory device context.

wxIcon::GetDepth

int GetDepth() const

Gets the colour depth of the icon. A value of 1 indicates a monochrome icon.

wxIcon::GetHeight

int GetHeight() const

Gets the height of the icon in pixels.

wxIcon::GetWidth

int GetWidth() const

Gets the width of the icon in pixels.

See also

wxIcon::GetHeight (p. 566)

wxIcon::LoadFile

bool LoadFile(const wxString& *name*, long *type*)

Loads an icon from a file or resource.

Parameters

name
Either a filename or a Windows resource name. The meaning of *name* is determined by the *type* parameter.

type
One of the following values:

wxBITMAP_TYPE_ICO   Load a Windows icon file.
wxBITMAP_TYPE_ICO_RESOURCE Load a Windows icon from the resource database.
wxBITMAP_TYPE_GIF   Load a GIF bitmap file.
wxBITMAP_TYPE_XBM   Load an X bitmap file.
wxBITMAP_TYPE_XPM   Load an XPM bitmap file.

The validity of these flags depends on the platform and wxWindows configuration.

Return value

TRUE if the operation succeeded, FALSE otherwise.

See also

wxIcon::wxIcon (p. 563)

wxIcon::Ok

bool Ok() **const**

Returns TRUE if icon data is present.

wxIcon::SetDepth

void SetDepth(**int** *depth*)

Sets the depth member (does not affect the icon data).

Parameters

depth
    Icon depth.

wxIcon::SetHeight

void SetHeight(**int** *height*)

Sets the height member (does not affect the icon data).

Parameters

height
    Icon height in pixels.

wxIcon::SetOk

void SetOk(**int** *isOk*)

Sets the validity member (does not affect the icon data).

Parameters

isOk
    Validity flag.

wxIcon::SetWidth

void SetWidth(**int** *width*)

Sets the width member (does not affect the icon data).

Parameters

width
Icon width in pixels.

wxIcon::operator =

wxIcon& operator =(**const wxIcon&** *icon*)

Assignment operator. This operator does not copy any data, but instead passes a pointer to the data in *icon* and increments a reference counter. It is a fast operation.

Parameters

icon
Icon to assign.

Return value

Returns 'this' object.

wxIcon::operator ==

bool operator ==(**const wxIcon&** *icon*)

Equality operator. This operator tests whether the internal data pointers are equal (a fast test).

Parameters

icon
Icon to compare with 'this'

Return value

Returns TRUE if the icons were effectively equal, FALSE otherwise.

wxIcon::operator !=

bool operator !=(**const wxIcon&** *icon*)

Inequality operator. This operator tests whether the internal data pointers are unequal (a fast test).

Parameters

icon
Icon to compare with 'this'

Return value

Returns TRUE if the icons were unequal, FALSE otherwise.

wxImage

This class encapsulates a platform-independent image. An image can be created from data, or using the constructor taking a wxBitmap object. An image can be loaded from a file in a variety of formats, and is extensible to new formats via image format handlers. Functions are available to set and get image bits, so it can be used for basic image manipulation.

A wxImage cannot (currently) be drawn directly to a *wxDC* (p. 282). Instead, a platform-specific *wxBitmap* (p. 54) object must be created from it using the *ConvertToBitmap* (p. 572) function. This bitmap can then be drawn in a device context, using *wxDC::DrawBitmap* (p. 286).

One colour value of the image may be used as a mask colour which will lead to the automatic creation of a *wxMask* (p. 663) object associated to the bitmap object.

Available image handlers

The following image handlers are available. **wxBMPHandler** is always installed by default. To use other image formats, install the appropiate handler with *wxImage::AddHandler* (p. 572) or *wxInitAllImageHandlers* (p. 1286).

wxBMPHandler	Only for loading, always installed.
wxPNGHandler	For loading and saving.
wxJPEGHandler	For loading and saving.
wxGIFHandler	Only for loading, due to legal issues.
wxPCXHandler	For loading and saving (see below).
wxPNMHandler	For loading and saving (see below).
wxTIFFHandler	For loading.

When saving in PCX format, **wxPCXHandler** will count the number of different colours in the image; if there are 256 or less colours, it will save as 8 bit, else it will save as 24 bit.

Loading PNMs only works for ASCII or raw RGB images. When saving in PNM format, **wxPNMHandler** will always save as raw RGB.

Derived from

wxObject (p. 750)

Include files

<wx/image.h>

See also

wxBitmap (p. 54), *wxInitAllImageHandlers* (p. 1286)

wxImage::wxImage

wxImage()

Default constructor.

wxImage(**const wxImage&** *image*)

Copy constructor.

wxImage(**const wxBitmap&** *bitmap*)

Constructs an image from a platform-dependent bitmap. This preserves mask information so that bitmaps and images can be converted back and forth without loss in that respect.

wxImage(**int** *width*, **int** *height*)

Creates an image with the given width and height.

wxImage(**int** *width*, **int** *height*, **unsigned char*** *data*, **bool** *static_data=FALSE*)

Creates an image from given data with the given width and height. If *static_data* is TRUE, then wxImage will not delete the actual image data in its destructor, otherwise it will free it by calling *free()*.

wxImage(**const wxString&** *name*, **long** *type = wxBITMAP_TYPE_ANY*)

wxImage(**const wxString&** *name*, **const wxString&** *mimetype*)

Loads an image from a file.

wxImage(**wxInputStream&** *stream*, **long** *type = wxBITMAP_TYPE_ANY*)

wxImage(**wxInputStream&** *stream*, **const wxString&** *mimetype*)

Loads an image from an input stream.

Parameters

width
Specifies the width of the image.

height
Specifies the height of the image.

name
Name of the file from which to load the image.

stream
Opened input stream from which to load the image. Currently, the stream must support seeking.

type
May be one of the following:

wxBITMAP_TYPE_BMP	Load a Windows bitmap file.
wxBITMAP_TYPE_GIF	Load a GIF bitmap file.
wxBITMAP_TYPE_JPEG	Load a JPEG bitmap file.
wxBITMAP_TYPE_PNG	Load a PNG bitmap file.
wxBITMAP_TYPE_PCX	Load a PCX bitmap file.
wxBITMAP_TYPE_PNM	Load a PNM bitmap file.
wxBITMAP_TYPE_TIF	Load a TIFF bitmap file.
wxBITMAP_TYPE_ANY	Will try to autodetect the format.

mimetype
MIME type string (for example 'image/jpeg')

Remarks

Depending on how wxWindows has been configured, not all formats may be available.

Note: any handler other than BMP must be previously initialized with *wxImage::AddHandler* (p. 572) or *wxInitAllImageHandlers* (p. 1286).

See also

wxImage::LoadFile (p. 577)

wxPython note: Constructors supported by wxPython are:

wxImage(name, flag)	Loads an image from a file
wxNullImage()	Create a null image (has no size or image data)

wxEmptyImage(width, height) Creates an empty image of the given size
wxImageFromMime(name, mimetype Creates an image from the given file
of the given mimetype
wxImageFromBitmap(bitmap) Creates an image from a platform-
dependent bitmap

wxImage::~wxImage

~wxImage()

Destructor.

wxImage::AddHandler

static void AddHandler(**wxImageHandler*** *handler*)

Adds a handler to the end of the static list of format handlers.

handler
A new image format handler object. There is usually only one instance of a given
handler class in an application session.

See also

wxImageHandler (p. 583)

wxPython note: In wxPython this static method is named `wxImage_AddHandler`.

wxImage::CleanUpHandlers

static void CleanUpHandlers()

Deletes all image handlers.

This function is called by wxWindows on exit.

wxImage::ConvertToBitmap

wxBitmap ConvertToBitmap() **const**

Converts the image to a platform-specific bitmap object. This has to be done to actually
display an image as you cannot draw an image directly on a window. The resulting
bitmap will use the colour depth of the current system which entails that a colour
reduction has to take place.

When in 8-bit mode (PseudoColour mode), the GTK port will use a color cube created
on program start-up to look up colors. This ensures a very fast conversion, but the image

quality won't be perfect (and could be better for photo images using more sophisticated dithering algorithms).

On Windows, if there is a palette present (set with SetPalette), it will be used when creating the wxBitmap (most useful in 8-bit display mode). On other platforms, the palette is currently ignored.

wxImage::Copy

wxImage Copy() **const**

Returns an identical copy of the image.

wxImage::Create

bool Create(**int** *width*, **int** *height*)

Creates a fresh image.

Parameters

width
    The width of the image in pixels.

height
    The height of the image in pixels.

Return value

TRUE if the call succeeded, FALSE otherwise.

wxImage::Destroy

bool Destroy()

Destroys the image data.

wxImage::FindHandler

static wxImageHandler* FindHandler(**const wxString&** *name*)

Finds the handler with the given name.

static wxImageHandler* FindHandler(**const wxString&** *extension*, **long** *imageType*)

Finds the handler associated with the given extension and type.

static wxImageHandler* FindHandler(**long** *imageType*)

Finds the handler associated with the given image type.

static wxImageHandler* FindHandlerMime(**const wxString&** *mimetype*)

Finds the handler associated with the given MIME type.

name
    The handler name.

extension
    The file extension, such as "bmp".

imageType
    The image type, such as wxBITMAP_TYPE_BMP.

mimetype
    MIME type.

Return value

A pointer to the handler if found, NULL otherwise.

See also

wxImageHandler (p. 583)

wxImage::GetBlue

unsigned char GetBlue(**int** *x*, **int** *y*) **const**

Returns the blue intensity at the given coordinate.

wxImage::GetData

unsigned char* GetData() **const**

Returns the image data as an array. This is most often used when doing direct image manipulation. The return value points to an array of chararcters in RGBGBRGB... format.

wxImage::GetGreen

unsigned char GetGreen(**int** *x*, **int** *y*) **const**

Returns the green intensity at the given coordinate.

wxImage::GetRed

unsigned char GetRed(**int** *x*, **int** *y*) **const**

Returns the red intensity at the given coordinate.

wxImage::GetHandlers

static wxList& GetHandlers()

Returns the static list of image format handlers.

See also

wxImageHandler (p. 583)

wxImage::GetHeight

int GetHeight() **const**

Gets the height of the image in pixels.

wxImage::GetMaskBlue

unsigned char GetMaskBlue() **const**

Gets the blue value of the mask colour.

wxImage::GetMaskGreen

unsigned char GetMaskGreen() **const**

Gets the green value of the mask colour.

wxImage::GetMaskRed

unsigned char GetMaskRed() **const**

Gets the red value of the mask colour.

wxImage::GetPalette

const wxPalette& GetPalette() const

Returns the palette associated with the image. Currently the palette is only used in ConvertToBitmap under Windows.

Eventually wxImage handlers will set the palette if one exists in the image file.

wxImage::GetSubImage

wxImage GetSubImage(const wxRect& *rect*) const

Returns a sub image of the current one as long as the rect belongs entirely to the image.

wxImage::GetWidth

int GetWidth() const

Gets the width of the image in pixels.

See also

wxImage::GetHeight (p. 575)

wxImage::HasMask

bool HasMask() const

Returns TRUE if there is a mask active, FALSE otherwise.

wxImage::InitStandardHandlers

static void InitStandardHandlers()

Internal use only. Adds standard image format handlers. It only install BMP for the time being, which is used by wxBitmap.

This function is called by wxWindows on startup, and shouldn't be called by the user.

See also

wxImageHandler (p. 583), *wxInitAllImageHandlers* (p. 1286)

wxImage::InsertHandler

static void InsertHandler(**wxImageHandler*** *handler*)

Adds a handler at the start of the static list of format handlers.

handler
> A new image format handler object. There is usually only one instance of a given handler class in an application session.

See also

wxImageHandler (p. 583)

wxImage::LoadFile

bool LoadFile(**const wxString&** *name*, **long** *type* = *wxBITMAP_TYPE_ANY*)

bool LoadFile(**const wxString&** *name*, **const wxString&** *mimetype*)

Loads an image from a file. If no handler type is provided, the library will try to autodetect the format.

bool LoadFile(**wxInputStream&** *stream*, **long** *type*)

bool LoadFile(**wxInputStream&** *stream*, **const wxString&** *mimetype*)

Loads an image from an input stream.

Parameters

name
> Name of the file from which to load the image.

stream
> Opened input stream from which to load the image. Currently, the stream must support seeking.

type
> One of the following values:

wxBITMAP_TYPE_BMP	Load a Windows image file.
wxBITMAP_TYPE_GIF	Load a GIF image file.
wxBITMAP_TYPE_JPEG	Load a JPEG image file.
wxBITMAP_TYPE_PCX	Load a PCX image file.
wxBITMAP_TYPE_PNG	Load a PNG image file.
wxBITMAP_TYPE_PNM	Load a PNM image file.
wxBITMAP_TYPE_TIF	Load a TIFF image file.
wxBITMAP_TYPE_ANY	Will try to autodetect the format.

mimetype
  MIME type string (for example 'image/jpeg')

Remarks

Depending on how wxWindows has been configured, not all formats may be available.

Return value

TRUE if the operation succeeded, FALSE otherwise.

See also

wxImage::SaveFile (p. 578)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

>   **LoadFile(filename, type)**   Loads an image of the given type from a file
>   **LoadMimeFile(filename, mimetype)**   Loads an image of the given
>   mimetype from a file

wxImage::Ok

bool Ok() **const**

Returns TRUE if image data is present.

wxImage::RemoveHandler

static bool RemoveHandler(**const wxString&** *name*)

Finds the handler with the given name, and removes it. The handler is not deleted.

name
  The handler name.

Return value

TRUE if the handler was found and removed, FALSE otherwise.

See also

wxImageHandler (p. 583)

wxImage::SaveFile

bool SaveFile(**const wxString&** *name*, **int** *type*)

bool SaveFile(**const wxString&** *name*, **const wxString&** *mimetype*)

Saves a image in the named file.

bool SaveFile(**wxOutputStream&** *stream*, **int** *type*)

bool SaveFile(**wxOutputStream&** *stream*, **const wxString&** *mimetype*)

Saves a image in the given stream.

Parameters

name
    Name of the file to save the image to.

stream
    Opened output stream to save the image to.

type
    Currently three types can be used:

wxBITMAP_TYPE_JPEG	Save a JPEG image file.
wxBITMAP_TYPE_PNG	Save a PNG image file.
wxBITMAP_TYPE_PCX	Save a PCX image file (tries to save as 8-bit if possible, falls back to 24-bit otherwise).
wxBITMAP_TYPE_PNM	Save a PNM image file (as raw RGB always).

mimetype
    MIME type.

Return value

TRUE if the operation succeeded, FALSE otherwise.

Remarks

Depending on how wxWindows has been configured, not all formats may be available.

See also

wxImage::LoadFile (p. 577)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

SaveFile(filename, type)	Saves the image using the given type to the named file

SaveMimeFile(filename, mimetype)   Saves the image using the given
mimetype to the named file

wxImage::Mirror

wxImage Mirror(**bool** *horizontally = TRUE*) **const**

Returns a mirrored copy of the image. The parameter *horizontally*indicates the
orientation.

wxImage::Replace

void Replace(**unsigned char** *r1*, **unsigned char** *g1*, **unsigned char** *b1*,**unsigned char**
r2, **unsigned char** *g2*, **unsigned char** *b2*)

Replaces the colour specified by *r1,g1,b1* by the colour *r2,g2,b2*.

wxImage::Rescale

wxImage & Rescale(**int** *width*, **int** *height*)

Changes the size of the image in-place: after a call to this function, the image will have
the given width and height.

Returns the (modified) image itself.

See also

Scale (p. 581)

wxImage::Rotate

wxImage Rotate(**double** *angle*, **const wxPoint&** *rotationCentre*, **bool** *interpolating =
TRUE*, **wxPoint*** *offsetAfterRotation = NULL*)

Rotates the image about the given point, by *angle* radians. Passing TRUE to
interpolating results in better image quality, but is slower. If the image has a mask, then
the mask colour is used for the uncovered pixels in the rotated image background. Else,
black (rgb 0, 0, 0) will be used.

Returns the rotated image, leaving this image intact.

wxImage::Rotate90

wxImage Rotate90(**bool** *clockwise = TRUE*) **const**

Returns a copy of the image rotated 90 degrees in the direction indicated by *clockwise*.

wxImage::Scale

wxImage Scale(**int** *width*, **int** *height*) **const**

Returns a scaled version of the image. This is also useful for scaling bitmaps in general as the only other way to scale bitmaps is to blit a wxMemoryDC into another wxMemoryDC.

It may be mentioned that the GTK port uses this function internally to scale bitmaps when using mapping modes in wxDC.

Example:

```
// get the bitmap from somewhere
wxBitmap bmp = ...;

// rescale it to have size of 32*32
if ( bmp.GetWidth() != 32 || bmp.GetHeight() != 32 )
{
    wxImage image(bmp);
    bmp = image.Scale(32, 32).ConvertToBitmap();

    // another possibility:
    image.Rescale(32, 32);
    bmp = image;
}
```

See also

Rescale (p. 580)

wxImage::SetData

void SetData(**unsigned char***data*)

Sets the image data without performing checks. The data given must have the size (width*height*3) or results will be unexpected. Don't use this method if you aren't sure you know what you are doing.

wxImage::SetMask

void SetMask(**bool** *hasMask = TRUE*)

Specifies whether there is a mask or not. The area of the mask is determined by the

current mask colour.

wxImage::SetMaskColour

void SetMaskColour(**unsigned char** *red*, **unsigned char** *blue*, **unsigned char** *green*)

Sets the mask colour for this image (and tells the image to use the mask).

wxImage::SetPalette

void SetPalette(**const wxPalette&** *palette*)

Associates a palette with the image. Currently, the palette is not used.

wxImage::SetRGB

void SetRGB(**int** *x*, **int** *y*, **unsigned char** *red*, **unsigned char** *green*, **unsigned char** *blue*)

Sets the pixel at the given coordinate. This routine performs bounds-checks for the coordinate so it can be considered a safe way to manipulate the data, but in some cases this might be too slow so that the data will have to be set directly. In that case you will have to get access to the image data using the *GetData* (p. 574) method.

wxImage::operator =

wxImage& operator =(**const wxImage&** *image*)

Assignment operator. This operator does not copy any data, but instead passes a pointer to the data in *image* and increments a reference counter. It is a fast operation.

Parameters

image
    Image to assign.

Return value

Returns 'this' object.

wxImage::operator ==

bool operator ==(**const wxImage&** *image*)

Equality operator. This operator tests whether the internal data pointers are equal (a fast

test).

Parameters

image
    Image to compare with 'this'

Return value

Returns TRUE if the images were effectively equal, FALSE otherwise.

wxImage::operator !=

bool operator !=(**const wxImage&** *image*)

Inequality operator. This operator tests whether the internal data pointers are unequal (a fast test).

Parameters

image
    Image to compare with 'this'

Return value

Returns TRUE if the images were unequal, FALSE otherwise.

wxImageHandler

This is the base class for implementing image file loading/saving, and image creation from data. It is used within wxImage and is not normally seen by the application.

If you wish to extend the capabilities of wxImage, derive a class from wxImageHandler and add the handler using *wxImage::AddHandler* (p. 572) in your application initialisation.

Note (Legal Issue)

This software is based in part on the work of the Independent JPEG Group.

(Applies when wxWindows is linked with JPEG support. wxJPEGHandler uses libjpeg created by IJG.)

Derived from

wxObject (p. 750)

Include files

<wx/image.h>

See also

wxImage (p. 569), *wxInitAllImageHandlers* (p. 1286)

wxImageHandler::wxImageHandler

wxImageHandler()

Default constructor. In your own default constructor, initialise the members m_name, m_extension and m_type.

wxImageHandler::~wxImageHandler

~wxImageHandler()

Destroys the wxImageHandler object.

wxImageHandler::GetName

wxString GetName() **const**

Gets the name of this handler.

wxImageHandler::GetExtension

wxString GetExtension() **const**

Gets the file extension associated with this handler.

wxImageHandler::GetImageCount

int GetImageCount(**wxInputStream&** *stream*)

If the image file contains more than one image and the image handler is capable of retrieving these individually, this function will return the number of available images.

stream
    Opened input stream for reading image data. Currently, the stream must support

seeking.

Return value

Number of available images. For most image handles, this defaults to 1.

wxImageHandler::GetType

long GetType() **const**

Gets the image type associated with this handler.

wxImageHandler::GetMimeType

wxString GetMimeType() **const**

Gets the MIME type associated with this handler.

wxImageHandler::LoadFile

bool LoadFile(**wxImage*** *image*, **wxInputStream&** *stream*, **bool** *verbose=TRUE*, **int** *index=0*)

Loads a image from a stream, putting the resulting data into *image*. If the image file contains more than one image and the image handler is capable of retrieving these individually, *index* indicates which image to read from the stream.

Parameters

image
　　The image object which is to be affected by this operation.

stream
　　Opened input stream for reading image data.

verbose
　　If set to TRUE, errors reported by the image handler will produce wxLogMessages.

index
　　The index of the image in the file (starting from zero).

Return value

TRUE if the operation succeeded, FALSE otherwise.

See also

wxImage::LoadFile (p. 577), *wxImage::SaveFile* (p. 578), *wxImageHandler::SaveFile* (p. 586)

wxImageHandler::SaveFile

bool SaveFile(**wxImage*** *image*, **wxOutputStream&** *stream*)

Saves a image in the output stream.

Parameters

image
The image object which is to be affected by this operation.

stream
Opened output stream for writing the data.

Return value

TRUE if the operation succeeded, FALSE otherwise.

See also

wxImage::LoadFile (p. 577), *wxImage::SaveFile* (p. 578), *wxImageHandler::LoadFile* (p. 585)

wxImageHandler::SetName

void SetName(**const wxString&** *name*)

Sets the handler name.

Parameters

name
Handler name.

wxImageHandler::SetExtension

void SetExtension(**const wxString&** *extension*)

Sets the handler extension.

Parameters

extension
Handler extension.

wxImageHandler::SetMimeType

void SetMimeType(**const wxString&** *mimetype*)

Sets the handler MIME type.

Parameters

mimename
    Handler MIME type.

wxImageHandler::SetType

void SetType(**long** *type*)

Sets the handler type.

Parameters

name
    Handler type.

wxImageList

A wxImageList contains a list of images, which are stored in an unspecified form. Images can have masks for transparent drawing, and can be made from a variety of sources including bitmaps and icons.

wxImageList is used principally in conjunction with *wxTreeCtrl* (p. 1140) and *wxListCtrl* (p. 634) classes.

Derived from

wxObject (p. 750)

Include files

<wx/imaglist.h>

See also

wxTreeCtrl (p. 1140), *wxListCtrl* (p. 634)

wxImageList::wxImageList

wxImageList()

Default constructor.

wxImageList(**int** *width*, **int** *height*, **const bool** *mask = TRUE*, **int** *initialCount = 1*)

Constructor specifying the image size, whether image masks should be created, and the initial size of the list.

Parameters

width
    Width of the images in the list.

height
    Height of the images in the list.

mask
    TRUE if masks should be created for all images.

initialCount
    The initial size of the list.

See also

wxImageList::Create (p. 589)

wxImageList::Add

int Add(**const wxBitmap&** *bitmap*, **const wxBitmap&** *mask = wxNullBitmap*)

Adds a new image using a bitmap and optional mask bitmap.

int Add(**const wxBitmap&** *bitmap*, **const wxColour&** *maskColour*)

Adds a new image using a bitmap and mask colour.

int Add(**const wxIcon&** *icon*)

Adds a new image using an icon.

Parameters

bitmap
    Bitmap representing the opaque areas of the image.

mask

    Monochrome mask bitmap, representing the transparent areas of the image.

maskColour

    Colour indicating which parts of the image are transparent.

icon

    Icon to use as the image.

Return value

The new zero-based image index.

Remarks

The original bitmap or icon is not affected by the **Add** operation, and can be deleted afterwards.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **Add(bitmap, mask=wxNullBitmap)**
> **AddWithColourMask(bitmap, colour)**
> **AddIcon(icon)**

wxImageList::Create

bool Create(**int** *width*, **int** *height*, **const bool** *mask = TRUE*, **int** *initialCount = 1*)

Initializes the list. See *wxImageList::wxImageList* (p. 588) for details.

wxImageList::Draw

bool Draw(**int** *index*, **wxDC&** *dc*, **int** *x*, **int** *x*, **int** *flags = wxIMAGELIST_DRAW_NORMAL*, **const bool** *solidBackground = FALSE*)

Draws a specified image onto a device context.

Parameters

index

    Image index, starting from zero.

dc

    Device context to draw on.

x

X position on the device context.

y

Y position on the device context.

flags

How to draw the image. A bitlist of a selection of the following:

wxIMAGELIST_DRAW_NORMAL   Draw the image normally.
wxIMAGELIST_DRAW_TRANSPARENT   Draw the image with transparency.
wxIMAGELIST_DRAW_SELECTED Draw the image in selected state.
wxIMAGELIST_DRAW_FOCUSED   Draw the image in a focussed state.

solidBackground

For optimisation - drawing can be faster if the function is told that the background is solid.

wxImageList::GetImageCount

int GetImageCount() const

Returns the number of images in the list.

wxImageList::GetSize

bool GetSize(int *index*, int& *width*, int &*height*) const

Retrieves the size of the images in the list. Currently, the *index* parameter is ignored as all images in the list have the same size.

Parameters

index

currently unused, should be 0

width

receives the width of the images in the list

height

receives the height of the images in the list

Return value

TRUE if the function succeeded, FALSE if it failed (for example, if the image list was not yet initialized).

wxImageList::Remove

bool Remove(**int** *index*)

Removes the image at the given position.

wxImageList::RemoveAll

bool RemoveAll()

Removes all the images in the list.

wxImageList::Replace

bool Replace(**int** *index*, **const wxBitmap&** *bitmap*, **const wxBitmap&** *mask* = *wxNullBitmap*)

Replaces the existing image with the new image.

bool Replace(**int** *index*, **const wxIcon&** *icon*)

Replaces the existing image with the new image.

Parameters

bitmap
    Bitmap representing the opaque areas of the image.

mask
    Monochrome mask bitmap, representing the transparent areas of the image.

icon
    Icon to use as the image.

Return value

TRUE if the replacement was successful, FALSE otherwise.

Remarks

The original bitmap or icon is not affected by the **Replace** operation, and can be deleted afterwards.

wxPython note: The second form is called `ReplaceIcon` in wxPython.

wxIndividualLayoutConstraint

Objects of this class are stored in the wxLayoutConstraint class as one of eight possible constraints that a window can be involved in.

Constraints are initially set to have the relationship wxUnconstrained, which means that their values should be calculated by looking at known constraints.

Derived from

wxObject (p. 750)

Include files

<wx/layout.h>

See also

Overview and examples (p. 1384), *wxLayoutConstraints* (p. 616), *wxWindow::SetConstraints* (p. 1229).

Edges and relationships

The *wxEdge* enumerated type specifies the type of edge or dimension of a window.

wxLeft	The left edge.
wxTop	The top edge.
wxRight	The right edge.
wxBottom	The bottom edge.
wxCentreX	The x-coordinate of the centre of the window.
wxCentreY	The y-coordinate of the centre of the window.

The *wxRelationship* enumerated type specifies the relationship that this edge or dimension has with another specified edge or dimension. Normally, the user doesn't use these directly because functions such as *Below* and *RightOf* are a convenience for using the more general *Set* function.

wxUnconstrained	The edge or dimension is unconstrained (the default for edges.
wxAsIs	The edge or dimension is to be taken from the current window position or size (the default for dimensions.
wxAbove	The edge should be above another edge.
wxBelow	The edge should be below another edge.
wxLeftOf	The edge should be to the left of another edge.
wxRightOf	The edge should be to the right of another edge.
wxSameAs	The edge or dimension should be the same as another edge or dimension.
wxPercentOf	The edge or dimension should be a percentage of another

edge or dimension.

wxAbsolute   The edge or dimension should be a given absolute value.

wxIndividualLayoutConstraint::wxIndividualLayoutConstraint

void wxIndividualLayoutConstraint()

Constructor. Not used by the end-user.

wxIndividualLayoutConstraint::Above

void Above(**wxWindow** *otherWin, **int** *margin = 0*)

Constrains this edge to be above the given window, with an optional margin. Implicitly, this is relative to the top edge of the other window.

wxIndividualLayoutConstraint::Absolute

void Absolute(**int** *value*)

Constrains this edge or dimension to be the given absolute value.

wxIndividualLayoutConstraint::AsIs

void AsIs()

Sets this edge or constraint to be whatever the window's value is at the moment. If either of the width and height constraints are *as is*, the window will not be resized, but moved instead. This is important when considering panel items which are intended to have a default size, such as a button, which may take its size from the size of the button label.

wxIndividualLayoutConstraint::Below

void Below(**wxWindow** *otherWin, **int** *margin = 0*)

Constrains this edge to be below the given window, with an optional margin. Implicitly, this is relative to the bottom edge of the other window.

wxIndividualLayoutConstraint::Unconstrained

void Unconstrained()

Sets this edge or dimension to be unconstrained, that is, dependent on other edges and dimensions from which this value can be deduced.

wxIndividualLayoutConstraint::LeftOf

void LeftOf(**wxWindow** **otherWin*, **int** *margin = 0*)

Constrains this edge to be to the left of the given window, with an optional margin. Implicitly, this is relative to the left edge of the other window.

wxIndividualLayoutConstraint::PercentOf

void PercentOf(**wxWindow** **otherWin*, **wxEdge** *edge*, **int** *per*)

Constrains this edge or dimension to be to a percentage of the given window, with an optional margin.

wxIndividualLayoutConstraint::RightOf

void RightOf(**wxWindow** **otherWin*, **int** *margin = 0*)

Constrains this edge to be to the right of the given window, with an optional margin. Implicitly, this is relative to the right edge of the other window.

wxIndividualLayoutConstraint::SameAs

void SameAs(**wxWindow** **otherWin*, **wxEdge** *edge*, **int** *margin = 0*)

Constrains this edge or dimension to be to the same as the edge of the given window, with an optional margin.

wxIndividualLayoutConstraint::Set

void Set(**wxRelationship** *rel*, **wxWindow** **otherWin*, **wxEdge** *otherEdge*, **int** *value = 0*, **int** *margin = 0*)

Sets the properties of the constraint. Normally called by one of the convenience functions such as Above, RightOf, SameAs.

wxInitDialogEvent

A wxInitDialogEvent is sent as a dialog or panel is being initialised. Handlers for this event can transfer data to the window.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process an activate event, use these event handler macros to direct input to a member function that takes a wxInitDialogEvent argument.

EVT_INIT_DIALOG(func)   Process a wxEVT_INIT_DIALOG event.

See also

wxWindow::OnInitDialog (p. 1217), *Event handling overview* (p. 1372)

wxInitDialogEvent::wxInitDialogEvent

wxInitDialogEvent(**int** *id = 0*)

Constructor.

wxInputStream

wxInputStream is an abstract base class which may not be used directly.

Derived from

wxStreamBase (p. 1003)

Include files

<wx/stream.h>

wxInputStream::wxInputStream

wxInputStream()

Creates a dummy input stream.

wxInputStream::~wxInputStream

~wxInputStream()

Destructor.

wxInputStream::GetC

char GetC()

Returns the first character in the input queue and removes it.

wxInputStream::Eof

wxInputStream Eof() **const**

Returns TRUE if the end of stream has been reached.

wxInputStream::LastRead

size_t LastRead() **const**

Returns the last number of bytes read.

wxInputStream::Peek

char Peek()

Returns the first character in the input queue without removing it.

wxInputStream::Read

wxInputStream& Read(**void** *buffer, **size_t** *size*)

Reads the specified amount of bytes and stores the data in *buffer*.

The buffer absolutely needs to have at least the specified size.

Return value

This function returns a reference on the current object, so the user can test any states of the stream right away.

wxInputStream& Read(**wxOutputStream&** *stream_out*)

Reads data from the input queue and stores it in the specified output stream. The data is read until an error is raised by one of the two streams.

Return value

This function returns a reference on the current object, so the user can test any states of the stream right away.

wxInputStream::SeekI

off_t SeekI(**off_t** *pos*, **wxSeekMode** *mode = wxFromStart*)

Changes the stream current position.

wxInputStream::TellI

off_t TellI() **const**

Returns the current stream position.

wxInputStream::Ungetch

size_t Ungetch(**const char*** *buffer*, **size_t** *size*)

This function is only useful in *read* mode. It is the manager of the "Write-Back" buffer. This buffer acts like a temporary buffer where datas which has to be read during the next read IO call are put. This is useful when you get a big block of data which you didn't want to read: you can replace them at the top of the input queue by this way.

Be very careful about this call in connection with calling SeekI() on the same stream. Any call to SeekI() will invalidate any previous call to this method (otherwise you could SeekI() to one position, "unread" a few bytes there, SeekI() to another position and data would be either lost or corrupted).

Return value

Returns the amount of bytes saved in the Write-Back buffer.

bool Ungetch(**char** *c*)

This function acts like the previous one except that it takes only one character: it is sometimes shorter to use than the generic function.

wxIntegerFormValidator

This class validates a range of integer values for a form view. The associated control must be a wxTextCtrl or wxSlider.

See also

Validator classes (p. 1463)

wxIntegerFormValidator::wxIntegerFormValidator

void wxIntegerFormValidator(**long** *min=0*, **long** *max=0*, **long** *flags=0*)

Constructor. Assigning zero to minimum and maximum values indicates that there is no range to check.

wxIntegerListValidator

This class validates a range of integer values for a list view.

See also

Validator classes (p. 1463)

wxIntegerListValidator::wxIntegerListValidator

void wxIntegerListValidator(**long** *min=0*, **long** *max=0*, **long** *flags=wxPROP_ALLOW_TEXT_EDITING*)

Constructor. Assigning zero to minimum and maximum values indicates that there is no

range to check.

wxIPV4address

Derived from

wxSockAddress (p. 942)

Include files

<wx/socket.h>

wxIPV4address::Hostname

bool Hostname(**const wxString&** *hostname*)

Set the address to *hostname*, which can be a host name or an IP-style address in dot notation (a.b.c.d)

Return value

Returns TRUE on success, FALSE if something goes wrong (invalid hostname or invalid IP address).

wxIPV4address::Hostname

wxString Hostname()

Returns the hostname which matches the IP address.

wxIPV4address::Service

bool Service(**const wxString&** *service*)

Set the port to that corresponding to the specified *service*.

Return value

Returns TRUE on success, FALSE if something goes wrong (invalid service).

wxIPV4address::Service

bool Service (**unsigned short** *service*)

Set the port to that corresponding to the specified *service*.

Return value

Returns TRUE on success, FALSE if something goes wrong (invalid service).

wxIPV4address::Service

unsigned short Service ()

Returns the current service.

wxIPV4address::AnyAddress

bool AnyAddress()

Set address to any of the addresses of the current machine. Whenever possible, use this function instead of *wxIPV4address::LocalHost* (p. 600), as this correctly handles multi-homed hosts and avoids other small problems. Internally, this is the same as setting the IP address to **INADDR_ANY**.

Return value

Returns TRUE on success, FALSE if something went wrong.

wxIPV4address::LocalHost

bool LocalHost()

Set address to localhost (127.0.0.1). Whenever possible, use the *wxIPV4address::AnyAddress* (p. 600), function instead of this one, as this will correctly handle multi-homed hosts and avoid other small problems.

Return value

Returns TRUE on success, FALSE if something went wrong.

wxJoystick

wxJoystick allows an application to control one or more joysticks.

Derived from

wxObject (p. 750)

Include files

<wx/joystick.h>

See also

wxJoystickEvent (p. 607)

wxJoystick::wxJoystick

wxJoystick(**int** *joystick = wxJOYSTICK1*)

Constructor. *joystick* may be one of wxJOYSTICK1, wxJOYSTICK2, indicating the joystick controller of interest.

wxJoystick::~wxJoystick

~wxJoystick()

Destroys the wxJoystick object.

wxJoystick::GetButtonState

int GetButtonState() **const**

Returns the state of the joystick buttons. A bitlist of wxJOY_BUTTONn identifiers, where n is 1, 2, 3 or 4.

wxJoystick::GetManufacturerId

int GetManufacturerId() **const**

Returns the manufacturer id.

wxJoystick::GetMovementThreshold

int GetMovementThreshold() **const**

Returns the movement threshold, the number of steps outside which the joystick is

deemed to have moved.

wxJoystick::GetNumberAxes

int GetNumberAxes() **const**

Returns the number of axes for this joystick.

wxJoystick::GetNumberButtons

int GetNumberButtons() **const**

Returns the number of buttons for this joystick.

wxJoystick::GetNumberJoysticks

int GetNumberJoysticks() **const**

Returns the number of joysticks currently attached to the computer.

wxJoystick::GetPollingMax

int GetPollingMax() **const**

Returns the maximum polling frequency.

wxJoystick::GetPollingMin

int GetPollingMin() **const**

Returns the minimum polling frequency.

wxJoystick::GetProductId

int GetProductId() **const**

Returns the product id for the joystick.

wxJoystick::GetProductName

wxString GetProductName() **const**

Returns the product name for the joystick.

wxJoystick::GetPosition

wxPoint GetPosition() const

Returns the x, y position of the joystick.

wxJoystick::GetPOVPosition

int GetPOVPosition() const

Returns the point-of-view position, expressed in discrete units.

wxJoystick::GetPOVCTSPosition

int GetPOVCTSPosition() const

Returns the point-of-view position, expressed in continuous, one-hundredth of a degree units.

wxJoystick::GetRudderMax

int GetRudderMax() const

Returns the maximum rudder position.

wxJoystick::GetRudderMin

int GetRudderMin() const

Returns the minimum rudder position.

wxJoystick::GetRudderPosition

int GetRudderPosition() const

Returns the rudder position.

wxJoystick::GetUMax

int GetUMax() const

Returns the maximum U position.

wxJoystick::GetUMin

int GetUMin() const

Returns the minimum U position.

wxJoystick::GetUPosition

int GetUPosition() const

Gets the position of the fifth axis of the joystick, if it exists.

wxJoystick::GetVMax

int GetVMax() const

Returns the maximum V position.

wxJoystick::GetVMin

int GetVMin() const

Returns the minimum V position.

wxJoystick::GetVPosition

int GetVPosition() const

Gets the position of the sixth axis of the joystick, if it exists.

wxJoystick::GetXMax

int GetXMax() const

Returns the maximum x position.

wxJoystick::GetXMin

int GetXMin() const

Returns the minimum x position.

wxJoystick::GetYMax

int GetYMax() **const**

Returns the maximum y position.

wxJoystick::GetYMin

int GetYMin() **const**

Returns the minimum y position.

wxJoystick::GetZMax

int GetZMax() **const**

Returns the maximum z position.

wxJoystick::GetZMin

int GetXMin() **const**

Returns the minimum z position.

wxJoystick::GetZPosition

int GetZPosition() **const**

Returns the z position of the joystick.

wxJoystick::HasPOV

bool HasPOV() **const**

Returns TRUE if the joystick has a point of view control.

wxJoystick::HasPOV4Dir

bool HasPOV4Dir() **const**

Returns TRUE if the joystick point-of-view supports discrete values (centered, forward, backward, left, and right).

wxJoystick::HasPOVCTS

bool HasPOVCTS() **const**

Returns TRUE if the joystick point-of-view supports continuous degree bearings.

wxJoystick::HasRudder

bool HasRudder() **const**

Returns TRUE if there is a rudder attached to the computer.

wxJoystick::HasU

bool HasU() **const**

Returns TRUE if the joystick has a U axis.

wxJoystick::HasV

bool HasV() **const**

Returns TRUE if the joystick has a V axis.

wxJoystick::HasZ

bool HasZ() **const**

Returns TRUE if the joystick has a Z axis.

wxJoystick::IsOk

bool IsOk() **const**

Returns TRUE if the joystick is functioning.

wxJoystick::ReleaseCapture

bool ReleaseCapture()

Releases the capture set by **SetCapture**.

Return value

TRUE if the capture release succeeded.

See also

wxJoystick::SetCapture (p. 607), *wxJoystickEvent* (p. 607)

wxJoystick::SetCapture

bool SetCapture(**wxWindow*** *win*, **int** *pollingFreq = 0*)

Sets the capture to direct joystick events to *win*.

Parameters

win
  The window that will receive joystick events.

pollingFreq
  If zero, movement events are sent when above the threshold. If greater than zero, events are received every *pollingFreq* milliseconds.

Return value

TRUE if the capture succeeded.

See also

wxJoystick::ReleaseCapture (p. 606), *wxJoystickEvent* (p. 607)

wxJoystick::SetMovementThreshold

void SetMovementThreshold(**int** *threshold*)

Sets the movement threshold, the number of steps outside which the joystick is deemed to have moved.

wxJoystickEvent

This event class contains information about mouse events, particularly events received

by windows.

Derived from

wxEvent (p. 377)

Include files

<wx/event.h>

Event table macros

To process a mouse event, use these event handler macros to direct input to member functions that take a wxJoystickEvent argument.

EVT_JOY_BUTTON_DOWN(func)	Process a wxEVT_JOY_BUTTON_DOWN event.
EVT_JOY_BUTTON_UP(func)	Process a wxEVT_JOY_BUTTON_UP event.
EVT_JOY_MOVE(func)	Process a wxEVT_JOY_MOVE event.
EVT_JOY_ZMOVE(func)	Process a wxEVT_JOY_ZMOVE event.

See also

wxJoystick (p. 600)

wxJoystickEvent::wxJoystickEvent

 wxJoystickEvent(**WXTYPE** *eventType = 0*, **int** *state = 0*, **int** *joystick = wxJOYSTICK1*, **int** *change = 0*)

Constructor.

wxJoystickEvent::ButtonDown

bool ButtonDown(**int** *button = wxJOY_BUTTON_ANY*) **const**

Returns TRUE if the event was a down event from the specified button (or any button).

Parameters

button
    Can be wxJOY_BUTTONn where n is 1, 2, 3 or 4; or wxJOY_BUTTON_ANY to indicate any button down event.

wxJoystickEvent::ButtonIsDown

bool ButtonIsDown(**int** *button = wxJOY_BUTTON_ANY*) **const**

Returns TRUE if the specified button (or any button) was in a down state.

Parameters

button
    Can be wxJOY_BUTTONn where n is 1, 2, 3 or 4; or wxJOY_BUTTON_ANY to
    indicate any button down event.

wxJoystickEvent::ButtonUp

bool ButtonUp(**int** *button = wxJOY_BUTTON_ANY*) **const**

Returns TRUE if the event was an up event from the specified button (or any button).

Parameters

button
    Can be wxJOY_BUTTONn where n is 1, 2, 3 or 4; or wxJOY_BUTTON_ANY to
    indicate any button down event.

wxJoystickEvent::GetButtonChange

int GetButtonChange() **const**

Returns the identifier of the button changing state. This is a wxJOY_BUTTONn identifier,
where n is one of 1, 2, 3, 4.

wxJoystickEvent::GetButtonState

int GetButtonState() **const**

Returns the down state of the buttons. This is a bitlist of wxJOY_BUTTONn identifiers,
where n is one of 1, 2, 3, 4.

wxJoystickEvent::GetJoystick

int GetJoystick() **const**

Returns the identifier of the joystick generating the event - one of wxJOYSTICK1 and
wxJOYSTICK2.

wxJoystickEvent::GetPosition

wxPoint GetPosition() **const**

Returns the x, y position of the joystick event.

wxJoystickEvent::GetZPosition

int GetZPosition() **const**

Returns the z position of the joystick event.

wxJoystickEvent::IsButton

bool IsButton() **const**

Returns TRUE if this was a button up or down event (*not* 'is any button down?').

wxJoystickEvent::IsMove

bool IsMove() **const**

Returns TRUE if this was an x, y move event.

wxJoystickEvent::IsZMove

bool IsZMove() **const**

Returns TRUE if this was a z move event.

wxKeyEvent

This event class contains information about keypress (character) events.

Derived from

wxEvent (p. 377)

Include files

<wx/event.h>

Event table macros

To process a key event, use these event handler macros to direct input to member functions that take a wxKeyEvent argument.

EVT_CHAR(func)	Process a wxEVT_CHAR event (a non-modifier key has been pressed).
EVT_KEY_DOWN(func)	Process a wxEVT_KEY_DOWN event (any key has been pressed).
EVT_KEY_UP(func)	Process a wxEVT_KEY_UP event (any key has been released).
EVT_CHAR(func)	Process a wxEVT_CHAR event.
EVT_CHAR_HOOK(func)	Process a wxEVT_CHAR_HOOK event.

See also

wxWindow::OnChar (p. 1211), *wxWindow::OnCharHook* (p. 1212), *wxWindow::OnKeyDown* (p. 1215), *wxWindow::OnKeyUp* (p. 1216)

wxKeyEvent::m_altDown

bool m_altDown

TRUE if the Alt key is pressed down.

wxKeyEvent::m_controlDown

bool m_controlDown

TRUE if control is pressed down.

wxKeyEvent::m_keyCode

long m_keyCode

Virtual keycode. See *Keycodes* (p. 1311) for a list of identifiers.

wxKeyEvent::m_metaDown

bool m_metaDown

TRUE if the Meta key is pressed down.

wxKeyEvent::m_shiftDown

bool m_shiftDown

TRUE if shift is pressed down.

wxKeyEvent::m_x

int m_x

X position of the event.

wxKeyEvent::m_y

int m_y

Y position of the event.

wxKeyEvent::wxKeyEvent

wxKeyEvent(**WXTYPE** *keyEventType*)

Constructor. Currently, the only valid event types are wxEVT_CHAR and
wxEVT_CHAR_HOOK.

wxKeyEvent::AltDown

bool AltDown() const

Returns TRUE if the Alt key was down at the time of the key event.

wxKeyEvent::ControlDown

bool ControlDown() const

Returns TRUE if the control key was down at the time of the key event.

wxKeyEvent::GetKeyCode

int GetKeyCode() const

Returns the virtual key code. ASCII events return normal ASCII values, while non-ASCII

events return values such as **WXK_LEFT** for the left cursor key. See *Keycodes* (p. 1311) for a full list of the virtual key codes.

wxKeyEvent::GetX

long GetX() **const**

Returns the X position of the event.

wxKeyEvent::GetY

long GetY() **const**

Returns the Y position of the event.

wxKeyEvent::MetaDown

bool MetaDown() **const**

Returns TRUE if the Meta key was down at the time of the key event.

wxKeyEvent::GetPosition

wxPoint GetPosition() **const**

void GetPosition(**long** *x*, **long** *y*) **const**

Obtains the position at which the key was pressed.

wxKeyEvent::HasModifiers

bool HasModifiers() **const**

Returns TRUE if either of CTRL, ALT or META keys was down at the time of the key event. Note that this function does not take into account the SHIFT key state.

wxKeyEvent::ShiftDown

bool ShiftDown() **const**

Returns TRUE if the shift key was down at the time of the key event.

wxLayoutAlgorithm

wxLayoutAlgorithm implements layout of subwindows in MDI or SDI frames. It sends a wxCalculateLayoutEvent event to children of the frame, asking them for information about their size. For MDI parent frames, the algorithm allocates the remaining space to the MDI client window (which contains the MDI child frames). For SDI (normal) frames, a 'main' window is specified as taking up the remaining space.

Because the event system is used, this technique can be applied to any windows, which are not necessarily 'aware' of the layout classes (no virtual functions in wxWindow refer to wxLayoutAlgorithm or its events). However, you may wish to use *wxSashLayoutWindow*(p. 898) for your subwindows since this class provides handlers for the required events, and accessors to specify the desired size of the window. The sash behaviour in the base class can be used, optionally, to make the windows user-resizable.

wxLayoutAlgorithm is typically used in IDE (integrated development environment) applications, where there are several resizable windows in addition to the MDI client window, or other primary editing window. Resizable windows might include toolbars, a project window, and a window for displaying error and warning messages.

When a window receives an OnCalculateLayout event, it should call SetRect in the given event object, to be the old supplied rectangle minus whatever space the window takes up. It should also set its own size accordingly.
wxSashLayoutWindow::OnCalculateLayout generates an OnQueryLayoutInfo event which it sends to itself to determine the orientation, alignment and size of the window, which it gets from internal member variables set by the application.

The algorithm works by starting off with a rectangle equal to the whole frame client area. It iterates through the frame children, generating OnCalculateLayout events which subtract the window size and return the remaining rectangle for the next window to process. It is assumed (by wxSashLayoutWindow::OnCalculateLayout) that a window stretches the full dimension of the frame client, according to the orientation it specifies. For example, a horizontal window will stretch the full width of the remaining portion of the frame client area. In the other orientation, the window will be fixed to whatever size was specified by OnQueryLayoutInfo. An alignment setting will make the window 'stick' to the left, top, right or bottom of the remaining client area. This scheme implies that order of window creation is important. Say you wish to have an extra toolbar at the top of the frame, a project window to the left of the MDI client window, and an output window above the status bar. You should therefore create the windows in this order: toolbar, output window, project window. This ensures that the toolbar and output window take up space at the top and bottom, and then the remaining height inbetween is used for the project window.

wxLayoutAlgorithm is quite independent of the way in which OnCalculateLayout chooses to interpret a window's size and alignment. Therefore you could implement a different window class with a new OnCalculateLayout event handler, that has a more sophisticated way of laying out the windows. It might allow specification of whether stretching occurs in the specified orientation, for example, rather than always assuming

stretching. (This could, and probably should, be added to the existing implementation).

Note: wxLayoutAlgorithm has nothing to do with wxLayoutConstraints. It is an alternative way of specifying layouts for which the normal constraint system is unsuitable.

Derived from

wxObject (p. 750)

Include files

<wx/laywin.h>

Event handling

The algorithm object does not respond to events, but itself generates the following events in order to calculate window sizes.

EVT_QUERY_LAYOUT_INFO(func)	Process a wxEVT_QUERY_LAYOUT_INFO event, to get size, orientation and alignment from a window. See *wxQueryLayoutInfoEvent* (p. 860).
EVT_CALCULATE_LAYOUT(func)	Process a wxEVT_CALCULATE_LAYOUT event, which asks the window to take a 'bite' out of a rectangle provided by the algorithm. See *wxCalculateLayoutEvent* (p. 94).

Data types

```
enum wxLayoutOrientation {
    wxLAYOUT_HORIZONTAL,
    wxLAYOUT_VERTICAL
};

enum wxLayoutAlignment {
    wxLAYOUT_NONE,
    wxLAYOUT_TOP,
    wxLAYOUT_LEFT,
    wxLAYOUT_RIGHT,
    wxLAYOUT_BOTTOM,
};
```

See also

wxSashEvent (p. 896), *wxSashLayoutWindow* (p. 898), *Event handling overview* (p. 1372)

wxCalculateLayoutEvent (p. 94), *wxQueryLayoutInfoEvent* (p. 860),

wxSashLayoutWindow (p. 898), *wxSashWindow* (p. 901)

wxLayoutAlgorithm::wxLayoutAlgorithm

wxLayoutAlgorithm()

Default constructor.

wxLayoutAlgorithm::~wxLayoutAlgorithm

~wxLayoutAlgorithm()

Destructor.

wxLayoutAlgorithm::LayoutFrame

bool LayoutFrame (**wxFrame*** *frame*, **wxWindow*** *mainWindow = NULL*) **const**

Lays out the children of a normal frame. *mainWindow* is set to occupy the remaining space.

This function simply calls *wxLayoutAlgorithm::LayoutWindow* (p. 616).

wxLayoutAlgorithm::LayoutMDIFrame

bool LayoutMDIFrame (**wxMDIParentFrame*** *frame*, **wxRect*** *rect = NULL*) **const**

Lays out the children of an MDI parent frame. If *rect* is non-NULL, the given rectangle will be used as a starting point instead of the frame's client area.

The MDI client window is set to occupy the remaining space.

wxLayoutAlgorithm::LayoutWindow

bool LayoutWindow(**wxWindow*** *parent*, **wxWindow*** *mainWindow = NULL*) **const**

Lays out the children of a normal frame or other window.

mainWindow is set to occupy the remaining space.

wxLayoutConstraints

Objects of this class can be associated with a window to define its layout constraints, with respect to siblings or its parent.

The class consists of the following eight constraints of class wxIndividualLayoutConstraint, some or all of which should be accessed directly to set the appropriate constraints.

- **left:** represents the left hand edge of the window
- **right:** represents the right hand edge of the window
- **top:** represents the top edge of the window
- **bottom:** represents the bottom edge of the window
- **width:** represents the width of the window
- **height:** represents the height of the window
- **centreX:** represents the horizontal centre point of the window
- **centreY:** represents the vertical centre point of the window

Most constraints are initially set to have the relationship wxUnconstrained, which means that their values should be calculated by looking at known constraints. The exceptions are *width* and *height*, which are set to wxAsIs to ensure that if the user does not specify a constraint, the existing width and height will be used, to be compatible with panel items which often have take a default size. If the constraint is wxAsIs, the dimension will not be changed.

Derived from

wxObject (p. 750)

Include files

<wx/layout.h>

See also

Overview and examples (p. 1384), *wxIndividualLayoutConstraint* (p. 591), *wxWindow::SetConstraints* (p. 1229)

wxLayoutConstraints::wxLayoutConstraints

wxLayoutConstraints()

Constructor.

wxLayoutConstraints::bottom

wxIndividualLayoutConstraint bottom

Constraint for the bottom edge.

wxLayoutConstraints::centreX

wxIndividualLayoutConstraint centreX

Constraint for the horizontal centre point.

wxLayoutConstraints::centreY

wxIndividualLayoutConstraint centreY

Constraint for the vertical centre point.

wxLayoutConstraints::height

wxIndividualLayoutConstraint height

Constraint for the height.

wxLayoutConstraints::left

wxIndividualLayoutConstraint left

Constraint for the left-hand edge.

wxLayoutConstraints::right

wxIndividualLayoutConstraint right

Constraint for the right-hand edge.

wxLayoutConstraints::top

wxIndividualLayoutConstraint top

Constraint for the top edge.

wxLayoutConstraints::width

wxIndividualLayoutConstraint width

Constraint for the width.

wxList

wxList classes provide linked list functionality for wxWindows, and for an application if it wishes. Depending on the form of constructor used, a list can be keyed on integer or string keys to provide a primitive look-up ability. See *wxHashTable* (p. 495) for a faster method of storage when random access is required.

While wxList class in the previous versions of wxWindows only could contain elements of type wxObject and had essentially untyped interface (thus allowing you to put apples in the list and read back oranges from it), the new wxList classes family may contain elements of any type and has much more stricter type checking. Unfortunately, it also requires an additional line to be inserted in your program for each list class you use (which is the only solution short of using templates which is not done in wxWindows because of portability issues).

The general idea is to have the base class wxListBase working with *void *data but make all of its dangerous (because untyped) functions protected, so that they can only be used from derived classes which, in turn, expose a type safe interface. With this approach a new wxList-like class must be defined for each list type (i.e. list of ints, of wxStrings or of MyObjects). This is done with *WX_DECLARE_LIST* and *WX_DEFINE_LIST* macros like this (notice the similarity with WX_DECLARE_OBJARRAY and WX_IMPLEMENT_OBJARRAY macros):

Example

```
// this part might be in a header or source (.cpp) file
class MyListElement
{
    ... // whatever
};

// declare our list class: this macro declares and partly
implements MyList
// class (which derives from wxListBase)
WX_DECLARE_LIST(MyListElement, MyList);

...

// the only requirment for the rest is to be AFTER the full
declaration of
// MyListElement (for WX_DECLARE_LIST forward declaration is
enough), but
// usually it will be found in the source file and not in the
header

#include <wx/listimpl.cpp>
```

```
    WX_DEFINE_LIST(MyList);

    // now MyList class may be used as a usual wxList, but all of its
methods
    // will take/return the objects of the right (i.e. MyListElement)
type. You
    // also have MyList::Node type which is the type-safe version of
wxNode.
    MyList list;
    MyListElement element;
    list.Append(element);       // ok
    list.Append(17);            // error: incorrect type

    // let's iterate over the list
    for ( MyList::Node *node = list.GetFirst(); node; node = node-
>GetNext() )
    {
        MyListElement *current = node->GetData();

        ...process the current element...
    }
```

For compatibility with previous versions wxList and wxStringList classes are still defined, but their usage is deprecated and they will disappear in the future versions completely.

In the documentation of the list classes below, you should replace wxNode with wxListName::Node and wxObject with the list element type (i.e. the first parameter of WX_DECLARE_LIST) for the template lists.

Derived from

wxObject (p. 750)

Include files

<wx/list.h>

Example

It is very common to iterate on a list as follows:

```
  ...
  wxWindow *win1 = new wxWindow(...);
  wxWindow *win2 = new wxWindow(...);

  wxList SomeList;
  SomeList.Append(win1);
  SomeList.Append(win2);

  ...

  wxNode *node = SomeList.GetFirst();
```

```
while (node)
{
  wxWindow *win = node->GetData();
  ...
  node = node->GetNext();
}
```

To delete nodes in a list as the list is being traversed, replace

```
...
node = node->GetNext();
...
```

with

```
...
delete win;
delete node;
node = SomeList.GetFirst();
...
```

See *wxNode* (p. 739) for members that retrieve the data associated with a node, and members for getting to the next or previous node.

See also

wxNode (p. 739), *wxStringList* (p. 1035), *wxArray* (p. 32)

wxList::wxList

wxList()

wxList(**unsigned int** *key_type*)

wxList(**int** *n*, **wxObject** **objects[]*)

wxList(**wxObject** *object, ...)

Constructors. *key_type* is one of wxKEY_NONE, wxKEY_INTEGER, or wxKEY_STRING, and indicates what sort of keying is required (if any).

objects is an array of *n* objects with which to initialize the list.

The variable-length argument list constructor must be supplied with a terminating NULL.

wxList::~wxList

~wxList()

Destroys the list. Also destroys any remaining nodes, but does not destroy client data held in the nodes.

wxList::Append

wxNode * Append(**wxObject ****object*)

wxNode * Append(**long** *key*, **wxObject ****object*)

wxNode * Append(**const wxString&** *key*, **wxObject ****object*)

Appends a new **wxNode** to the end of the list and puts a pointer to the *object* in the node. The last two forms store a key with the object for later retrieval using the key. The new node is returned in each case.

The key string is copied and stored by the list implementation.

wxList::Clear

void Clear()

Clears the list (but does not delete the client data stored with each node unless you called DeleteContents(TRUE), in which case it deletes data).

wxList::DeleteContents

void DeleteContents(**bool** *destroy*)

If *destroy* is TRUE, instructs the list to call *delete* on the client contents of a node whenever the node is destroyed. The default is FALSE.

wxList::DeleteNode

bool DeleteNode(**wxNode ****node*)

Deletes the given node from the list, returning TRUE if successful.

wxList::DeleteObject

bool DeleteObject(**wxObject ****object*)

Finds the given client *object* and deletes the appropriate node from the list, returning TRUE if successful. The application must delete the actual object separately.

wxList::Find

wxNode * Find(**long** *key*)

wxNode * Find(**const wxString&** *key*)

Returns the node whose stored key matches *key*. Use on a keyed list only.

wxList::GetCount

size_t GetCount() **const**

Returns the number of elements in the list.

wxList::GetFirst

wxNode * GetFirst()

Returns the first node in the list (NULL if the list is empty).

wxList::GetLast

wxNode * GetLast()

Returns the last node in the list (NULL if the list is empty).

wxList::IndexOf

int IndexOf(**wxObject*** *obj*)

Returns the index of *obj* within the list or NOT_FOUND if *obj* is not found in the list.

wxList::Insert

wxNode * Insert(**wxObject** **object*)

Insert object at front of list.

wxNode * Insert(**size_t** *position*, **wxObject** **object*)

Insert object before *position*, i.e. the index of the new item in the list will be equal to *position*. *position* should be less than or equal to *GetCount* (p. 623); if it is equal to it, this is the same as calling *Append* (p. 622).

wxNode * Insert(**wxNode ****node*, **wxObject ****object*)

Inserts the object before the given *node*.

wxList::Item

wxNode * Item(**size_t** *index*) **const**

Returns the node at given position in the list.

wxList::Member

wxNode * Member(**wxObject ****object*)

NB: This function is deprecated, use *Find* (p. 623) instead.

Returns the node associated with *object* if it is in the list, NULL otherwise.

wxList::Nth

wxNode * Nth(**int** *n*)

NB: This function is deprecated, use *Item* (p. 624) instead.

Returns the *nth* node in the list, indexing from zero (NULL if the list is empty or the nth node could not be found).

wxList::Number

int Number()

NB: This function is deprecated, use *GetCount* (p. 623) instead.

Returns the number of elements in the list.

wxList::Sort

void Sort(**wxSortCompareFunction** *compfunc*)

```
  // Type of compare function for list sort operation (as in 'qsort')
  typedef int (*wxSortCompareFunction)(const void *elem1, const void
*elem2);
```

Allows the sorting of arbitrary lists by giving a function to compare two list elements. We

use the system **qsort** function for the actual sorting process. The sort function receives pointers to wxObject pointers (wxObject **), so be careful to dereference appropriately.

Example:

```
int listcompare(const void *arg1, const void *arg2)
{
  return(compare(**(wxString **)arg1,    // use the wxString
'compare'
                 **(wxString **)arg2));  // function
}

void main()
{
  wxList list;

  list.Append(new wxString("DEF"));
  list.Append(new wxString("GHI"));
  list.Append(new wxString("ABC"));
  list.Sort(listcompare);
}
```

wxListBox

A listbox is used to select one or more of a list of strings. The strings are displayed in a scrolling box, with the selected string(s) marked in reverse video. A listbox can be single selection (if an item is selected, the previous selection is removed) or multiple selection (clicking an item toggles the item on or off independently of other selections).

List box elements are numbered from zero. Their number is limited in some platforms (e.g. ca. 2000 on GTK).

A listbox callback gets an event wxEVT_COMMAND_LISTBOX_SELECT for single clicks, and wxEVT_COMMAND_LISTBOX_DOUBLE_CLICKED for double clicks.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/listbox.h>

Window styles

wxLB_SINGLE   Single-selection list.

wxLB_MULTIPLE	Multiple-selection list: the user can toggle multiple items on and off.
wxLB_EXTENDED	Extended-selection list: the user can select multiple items using the SHIFT key and the mouse or special key combinations.
wxLB_HSCROLL	Create horizontal scrollbar if contents are too wide (Windows only).
wxLB_ALWAYS_SB	Always show a vertical scrollbar.
wxLB_NEEDED_SB	Only create a vertical scrollbar if needed.
wxLB_SORT	The listbox contents are sorted in alphabetical order. No effect for GTK.

See also *window styles overview* (p. 1379).

Event handling

EVT_LISTBOX(id, func)	Process a wxEVT_COMMAND_LISTBOX_SELECTED event, when an item on the list is selected.
EVT_LISTBOX_DCLICK(id, func)	Process a wxEVT_COMMAND_LISTBOX_DOUBLECLIC KED event, when the listbox is doubleclicked.

See also

wxChoice (p. 113), *wxComboBox* (p. 144), *wxListCtrl* (p. 634), *wxCommandEvent* (p. 153)

wxListBox::wxListBox

wxListBox()

Default constructor.

wxListBox(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **int** *n*, **const wxString** *choices[]* = *NULL*, **long** *style* = *0*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"listBox"*)

Constructor, creating and showing a list box.

Parameters

parent
    Parent window. Must not be NULL.

id

Window identifier. A value of -1 indicates a default value.

pos

Window position.

size

Window size. If the default size (-1, -1) is specified then the window is sized appropriately.

n

Number of strings with which to initialise the control.

choices

An array of strings with which to initialise the control.

style

Window style. See *wxListBox* (p. 625).

validator

Window validator.

name

Window name.

See also

wxListBox::Create (p. 628), *wxValidator* (p. 1172)

wxPython note: The wxListBox constructor in wxPython reduces the `n` and `choices` arguments are to a single argument, which is a list of strings.

wxListBox::~wxListBox

void ~wxListBox()

Destructor, destroying the list box.

wxListBox::Append

void Append(**const wxString&** *item*)

Adds the item to the end of the list box.

void Append(**const wxString&** *item*, **void*** *clientData*)

Adds the item to the end of the list box, associating the given data with the item.

Parameters

item
    String to add.

clientData
    Client data to associate with the item.

wxListBox::Clear

void Clear()

Clears all strings from the list box.

wxListBox::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **int** *n*, **const wxString** *choices[] = NULL*, **long** *style = 0*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "listBox"*)

Creates the listbox for two-step construction. See *wxListBox::wxListBox* (p. 626) for further details.

wxListBox::Delete

void Delete(**int** *n*)

Deletes an item from the listbox.

Parameters

n
    The zero-based item index.

wxListBox::Deselect

void Deselect(**int** *n*)

Deselects an item in the list box.

Parameters

n
    The zero-based item to deselect.

Remarks

This applies to multiple selection listboxes only.

wxListBox::FindString

int FindString(**const wxString&** *string*)

Finds an item matching the given string.

Parameters

string
    String to find.

Return value

The zero-based position of the item, or -1 if the string was not found.

wxListBox::GetClientData

void* GetClientData(**int** *n*) **const**

Returns a pointer to the client data associated with the given item (if any).

Parameters

n
    The zero-based position of the item.

Return value

A pointer to the client data, or NULL if not present.

wxListBox::GetSelection

int GetSelection() **const**

Gets the position of the selected item.

Return value

The position of the current selection.

Remarks

Applicable to single selection list boxes only.

See also

wxListBox::SetSelection (p. 633), *wxListBox::GetStringSelection* (p. 631),
wxListBox::GetSelections (p. 630)

wxListBox::GetSelections

int GetSelections(**wxArrayInt&** *selections*) **const**

Fill an array of ints with the positions of the currently selected items.

Parameters

selections
　　A reference to an wxArrayInt instance that is used to store the result of the query.

Return value

The number of selections.

Remarks

Use this with a multiple selection listbox.

See also

wxListBox::GetSelection (p. 629), *wxListBox::GetStringSelection* (p. 631),
wxListBox::SetSelection (p. 633)

wxPython note: The wxPython version of this method takes no parameters and returns
a tuple of the selected items.

wxListBox::GetString

wxString GetString(**int** *n*) **const**

Returns the string at the given position.

Parameters

n
　　The zero-based position.

Return value

The string, or an empty string if the position was invalid.

wxListBox::GetStringSelection

wxString GetStringSelection() **const**

Gets the selected string - for single selection list boxes only. This must be copied by the calling program if long term use is to be made of it.

See also

wxListBox::GetSelection (p. 629), *wxListBox::GetSelections* (p. 630), *wxListBox::SetSelection* (p. 633)

wxListBox::InsertItems

void InsertItems(**int** *nItems*, **const wxString** *items*, **int** *pos*)

Insert the given number of strings before the specified position.

Parameters

nItems
Number of items in the array *items*

items
Labels of items to be inserted

pos
Position before which to insert the items: for example, if *pos* is 0 the items will be inserted in the beginning of the listbox

wxPython note: The first two parameters are collapsed into a single parameter for wxPython, which is a list of strings.

wxListBox::Number

int Number() **const**

Returns the number of items in the listbox.

wxListBox::Selected

bool Selected(**int** *n*) **const**

Determines whether an item is selected.

Parameters

n
>   The zero-based item index.

Return value

TRUE if the given item is selected, FALSE otherwise.

wxListBox::Set

void Set(**int** *n*, **const wxString*** *choices*)

Clears the list box and adds the given strings. Not implemented for GTK.

Parameters

n
>   The number of strings to set.

choices
>   An array of strings to set.

Remarks

Deallocate the array from the calling program after this function has been called.

wxListBox::SetClientData

void SetClientData(**int** *n*, **void*** *data*)

Associates the given client data pointer with the given item.

Parameters

n
>   The zero-based item index.

data
>   The client data to associate with the item.

wxListBox::SetFirstItem

void SetFirstItem(**int** *n*)

void SetFirstItem(**const wxString&** *string*)

Set the specified item to be the first visible item. Windows only.

Parameters

n

    The zero-based item index.

string

    The string that should be visible.

wxListBox::SetSelection

void SetSelection(**int** *n*, **const bool** *select = TRUE*)

Selects or deselects the given item. This does not cause a
wxEVT_COMMAND_LISTBOX_SELECT event to get emitted.

Parameters

n

    The zero-based item index.

select

    If TRUE, will select the item. If FALSE, will deselect it.

wxListBox::SetString

void SetString(**int** *n*, **const wxString&** *string*)

Sets the string value of an item.

Parameters

n

    The zero-based item index.

string

    The string to set.

wxListBox::SetStringSelection

void SetStringSelection(**const wxString&** *string*, **const bool** *select = TRUE*)

Sets the current selection. This does not cause a
wxEVT_COMMAND_LISTBOX_SELECT event to get emitted.

Parameters

string
      The item to select.

select
      If TRUE, will select the item. If FALSE, will deselect it.

wxListCtrl

A list control presents lists in a number of formats: list view, report view, icon view and small icon view. In any case, elements are numbered from zero.

Using many of wxListCtrl is shown in the*corresponding sample* (p. 1332).

To intercept events from a list control, use the event table macros described in *wxListEvent* (p. 648).

Derived from

wxControl (p. 177)
wxWindow(p. 1190)
wxEvtHandler (p. 380)
wxObject(p. 750)

Include files

<wx/listctrl.h>

Window styles

wxLC_LIST	multicolumn list view, with optional small icons. Columns are computed automatically, i.e. you don't set columns as in wxLC_REPORT. In other words, the list wraps, unlike a wxListBox.
wxLC_REPORT	single or multicolumn report view, with optional header.
wxLC_ICON	Large icon view, with optional labels.
wxLC_SMALL_ICON	Small icon view, with optional labels.
wxLC_ALIGN_TOP	Icons align to the top. Win32 default, Win32 only.
wxLC_ALIGN_LEFT	Icons align to the left.
wxLC_AUTOARRANGE	Icons arrange themselves. Win32 only.
wxLC_USER_TEXT	The application provides label text on demand, except for column headers. Win32 only.
wxLC_EDIT_LABELS	Labels are editable: the application will be notified when editing starts.
wxLC_NO_HEADER	No header in report mode. Win32 only.
wxLC_SINGLE_SEL	Single selection.
wxLC_SORT_ASCENDING	Sort in ascending order (must still supply a comparison callback in SortItems.

wxLC_SORT_DESCENDING   Sort in descending order (must still supply a comparison callback in SortItems.

See also *window styles overview* (p. 1379).

Event handling

To process input from a list control, use these event handler macros to direct input to member functions that take a *wxListEvent* (p. 648) argument.

EVT_LIST_BEGIN_DRAG(id, func)   Begin dragging with the left mouse button.
EVT_LIST_BEGIN_RDRAG(id, func)   Begin dragging with the right mouse button.
EVT_LIST_BEGIN_LABEL_EDIT(id, func) Begin editing a label. This can be prevented by calling *Veto()* (p. 750).
EVT_LIST_END_LABEL_EDIT(id, func)   Finish editing a label. This can be prevented by calling *Veto()* (p. 750).
EVT_LIST_DELETE_ITEM(id, func)   Delete an item.
EVT_LIST_DELETE_ALL_ITEMS(id, func) Delete all items.
EVT_LIST_GET_INFO(id, func)   Request information from the application, usually the item text.
EVT_LIST_SET_INFO(id, func)   Information is being supplied (not implemented).
EVT_LIST_ITEM_SELECTED(id, func) The item has been selected.
EVT_LIST_ITEM_DESELECTED(id, func) The item has been deselected.
EVT_LIST_ITEM_ACTIVATED(id, func) The item has been activated (ENTER or double click).
EVT_LIST_KEY_DOWN(id, func)   A key has been pressed.
EVT_LIST_INSERT_ITEM(id, func)   An item has been inserted.
EVT_LIST_COL_CLICK(id, func)   A column (**m_col**) has been left-clicked.

See also

wxListCtrl overview (p. 1406), *wxListBox* (p. 625), *wxTreeCtrl* (p. 1140), *wxImageList* (p. 587), *wxListEvent* (p. 648)

wxListCtrl::wxListCtrl

wxListCtrl()

Default constructor.

wxListCtrl(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxLC_ICON*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"listCtrl"*)

Constructor, creating and showing a list control.

Parameters

parent

Parent window. Must not be NULL.

id

Window identifier. A value of -1 indicates a default value.

pos

Window position.

size

Window size. If the default size (-1, -1) is specified then the window is sized appropriately.

style

Window style. See *wxListCtrl* (p. 634).

validator

Window validator.

name

Window name.

See also

wxListCtrl::Create (p. 637), *wxValidator* (p. 1172)

wxListCtrl::~wxListCtrl

void ~wxListCtrl()

Destructor, destroying the list control.

wxListCtrl::Arrange

bool Arrange(**int** *flag* = *wxLIST_ALIGN_DEFAULT*)

Arranges the items in icon or small icon view. This only has effect on Win32. *flag* is one of:

wxLIST_ALIGN_DEFAULT   Default alignment.
wxLIST_ALIGN_LEFT   Align to the left side of the control.
wxLIST_ALIGN_TOP   Align to the top side of the control.
wxLIST_ALIGN_SNAP_TO_GRID   Snap to grid.

wxListCtrl::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* =
wxDefaultPosition, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxLC_ICON*,
const wxValidator& *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"listCtrl"*)

Creates the list control. See *wxListCtrl::wxListCtrl* (p. 635) for further details.

wxListCtrl::ClearAll

void ClearAll()

Deletes all items and all columns.

wxListCtrl::DeleteItem

bool DeleteItem(**long** *item*)

Deletes the specified item. This function sends
the`wxEVT_COMMAND_LIST_DELETE_ITEM` event for the item being deleted.

See also: *DeleteAllItems* (p. 637)

wxListCtrl::DeleteAllItems

bool DeleteAllItems()

Deletes all the items in the list control.

NB: This function does *not* send the`wxEVT_COMMAND_LIST_DELETE_ITEM` event
because deleting many items from the control would be too slow then (unlike *DeleteItem*
(p. 637)).

wxListCtrl::DeleteColumn

bool DeleteColumn(**int** *col*)

Deletes a column.

wxListCtrl::EditLabel

void EditLabel(**long** *item*)

Starts editing the label of the given item. This function generates a
EVT_LIST_BEGIN_LABEL_EDIT event which can be vetoed so that no text control will
appear for in-place editing.

If the user changed the label (i.e. s/he does not press ESC or leave the text control
without changes, a EVT_LIST_END_LABEL_EDIT event will be sent which can be
vetoed as well.

wxListCtrl::EnsureVisible

bool EnsureVisible(**long** *item*)

Ensures this item is visible.

wxListCtrl::FindItem

long FindItem(**long** *start*, **const wxString&** *str*, **const bool** *partial = FALSE*)

Find an item whose label matches this string, starting from the item *start*.

long FindItem(**long** *start*, **long** *data*)

Find an item whose data matches this data, starting from the item *start*.

long FindItem(**long** *start*, **const wxPoint&** *pt*, **int** *direction*)

Find an item nearest this position in the specified direction, starting from the item *start*.

NB: The meaning of parameters *start* has changed in wxMSW version 2.2.0, previously
the item with this index was excluded from the search but it is included now.

wxPython note: In place of a single overloaded method name, wxPython implements
the following methods:

> **FindItem(start, str, partial=FALSE)**
> **FindItemData(start, data)**
> **FindItemAtPos(start, point, direction)**

wxListCtrl::GetColumn

bool GetColumn(**int** *col*, **wxListItem&** *item*) **const**

Gets information about this column. See *wxListCtrl::SetItem* (p. 645) for more
information.

wxListCtrl::GetColumnWidth

int GetColumnWidth(int *col*) const

Gets the column width (report view only).

wxListCtrl::GetCountPerPage

int GetCountPerPage() const

Gets the number of items that can fit vertically in the visible area of the list control (list or report view) or the total number of items in the list control (icon or small icon view).

wxListCtrl::GetEditControl

wxTextCtrl& GetEditControl() const

Gets the edit control for editing labels.

wxListCtrl::GetImageList

wxImageList* GetImageList(int *which*) const

Returns the specified image list. *which* may be one of:

wxIMAGE_LIST_NORMAL The normal (large icon) image list.
wxIMAGE_LIST_SMALL The small icon image list.
wxIMAGE_LIST_STATE The user-defined state image list (unimplemented).

wxListCtrl::GetItem

bool GetItem(wxListItem& *info*) const

Gets information about the item. See *wxListCtrl::SetItem* (p. 645) for more information.

You must call *info.SetId()* to se ID of item you're interested in before calling this method.

wxPython note: The wxPython version of this method takes an integer parameter for the item ID, an optional integer for the column number, and returns the wxListItem object.

wxListCtrl::GetItemData

long GetItemData(**long** *item*) **const**

Gets the application-defined data associated with this item.

wxListCtrl::GetItemPosition

bool GetItemPosition(**long** *item*, **wxPoint&** *pos*) **const**

Returns the position of the item, in icon or small icon view.

wxPython note: The wxPython version of this method accepts only the item ID and returns the wxPoint.

wxListCtrl::GetItemRect

bool GetItemRect(**long** *item*, **wxRect&** *rect*, **int** *code* = *wxLIST_RECT_BOUNDS*) **const**

Returns the rectangle representing the item's size and position, in client coordinates.

code is one of wxLIST_RECT_BOUNDS, wxLIST_RECT_ICON, wxLIST_RECT_LABEL.

wxPython note: The wxPython version of this method accepts only the item ID and code and returns the wxRect.

wxListCtrl::GetItemState

int GetItemState(**long** *item*, **long** *stateMask*) **const**

Gets the item state. For a list of state flags, see *wxListCtrl::SetItem* (p. 645).

The **stateMask** indicates which state flags are of interest.

wxListCtrl::GetItemCount

int GetItemCount() **const**

Returns the number of items in the list control.

wxListCtrl::GetItemSpacing

int GetItemSpacing(**bool** *isSmall*) **const**

Retrieves the spacing between icons in pixels. If *small* is TRUE, gets the spacing for the

small icon view, otherwise the large icon view.

wxListCtrl::GetItemText

wxString GetItemText(**long** *item*) **const**

Gets the item text for this item.

wxListCtrl::GetNextItem

long GetNextItem(long *item*, **int** *geometry = wxLIST_NEXT_ALL*, **int** *state = wxLIST_STATE_DONTCARE*) **const**

Searches for an item with the given goemetry or state, starting from *item* but excluding the *item* itself. If *item* is -1, the first item that matches the specified flags will be returned.

Returns the first item with given state following *item* or -1 if no such item found.

This function may be used to find all selected items in the control like this:

```
long item = -1;
for ( ;; )
{
    item = listctrl->GetNextItem(item,
                                 wxLIST_NEXT_ALL,
                                 wxLIST_STATE_SELECTED);
    if ( item == -1 )
        break;

    // this item is selected - do whatever is needed with it
    wxLogMessage("Item %ld is selected."), item);
}
```

geometry can be one of:

wxLIST_NEXT_ABOVE	Searches for an item above the specified item.
wxLIST_NEXT_ALL	Searches for subsequent item by index.
wxLIST_NEXT_BELOW	Searches for an item below the specified item.
wxLIST_NEXT_LEFT	Searches for an item to the left of the specified item.
wxLIST_NEXT_RIGHT	Searches for an item to the right of the specified item.

NB: this parameters is only supported by wxMSW currently and ignored on other platforms.

state can be a bitlist of the following:

wxLIST_STATE_DONTCARE	Don't care what the state is.
wxLIST_STATE_DROPHILITED	The item indicates it is a drop target.
wxLIST_STATE_FOCUSED	The item has the focus.

wxLIST_STATE_SELECTEDThe item is selected.
wxLIST_STATE_CUT   The item is selected as part of a cut and paste operation.

wxListCtrl::GetSelectedItemCount

int GetSelectedItemCount() const

Returns the number of selected items in the list control.

wxListCtrl::GetTextColour

wxColour GetTextColour() const

Gets the text colour of the list control.

wxListCtrl::GetTopItem

long GetTopItem() const

Gets the index of the topmost visible item when in list or report view.

wxListCtrl::HitTest

long HitTest(const wxPoint& *point*, int& *flags*)

Determines which item (if any) is at the specified point, giving details in *flags*. *flags* will
be a combination of the following flags:

wxLIST_HITTEST_ABOVE   Above the client area.
wxLIST_HITTEST_BELOW   Below the client area.
wxLIST_HITTEST_NOWHERE   In the client area but below the last item.
wxLIST_HITTEST_ONITEMICON   On the bitmap associated with an item.
wxLIST_HITTEST_ONITEMLABEL   On the label (string) associated with an item.
wxLIST_HITTEST_ONITEMRIGHT   In the area to the right of an item.
wxLIST_HITTEST_ONITEMSTATEICON   On the state icon for a tree view item that is
                       in a user-defined state.
wxLIST_HITTEST_TOLEFT To the right of the client area.
wxLIST_HITTEST_TORIGHT   To the left of the client area.
wxLIST_HITTEST_ONITEM Combination of wxLIST_HITTEST_ONITEMICON,
                       wxLIST_HITTEST_ONITEMLABEL,
                       wxLIST_HITTEST_ONITEMSTATEICON.

wxPython note: A tuple of values is returned in the wxPython version of this method.
The first value is the item id and the second is the flags value mentioned above.

wxListCtrl::InsertColumn

long InsertColumn(**long** *col*, **wxListItem&** *info*)

For list view mode (only), inserts a column. For more details, see *wxListCtrl::SetItem* (p. 645).

long InsertColumn(**long** *col*, **const wxString&** *heading*, **int** *format* = *wxLIST_FORMAT_LEFT*, **int** *width = -1*)

For list view mode (only), inserts a column. For more details, see *wxListCtrl::SetItem* (p. 645).

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

    InsertColumn(col, heading, format=wxLIST_FORMAT_LEFT, width=-1)
                      Creates a column using a header string only.
    InsertColumnInfo(col, item)   Creates a column using a wxListInfo.

wxListCtrl::InsertItem

long InsertItem(**wxListItem&** *info*)

Inserts an item, returning the index of the new item if successful, -1 otherwise.

long InsertItem(**long** *index*, **const wxString&** *label*)

Inserts a string item.

long InsertItem(**long** *index*, **int** *imageIndex*)

Inserts an image item.

long InsertItem(**long** *index*, **const wxString&** *label*, **int** *imageIndex*)

Insert an image/string item.

Parameters

info
    wxListItem object

index
    Index of the new item, supplied by the application

label
>   String label

imageIndex
>   index into the image list associated with this control and view style

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

InsertItem(item)	Inserts an item using a wxListItem.
InsertStringItem(index, label)	Inserts a string item.
InsertImageItem(index, imageIndex)	Inserts an image item.
InsertImageStringItem(index, label, imageIndex)	Insert an image/string item.

wxListCtrl::ScrollList

bool ScrollList(**int** *dx*, **int** *dy*)

Scrolls the list control. If in icon, small icon or report view mode, dx specifies the number of pixels to scroll. If in list view mode, dx specifies the number of columns to scroll.

If in icon, small icon or list view mode, dy specifies the number of pixels to scroll. If in report view mode, dy specifies the number of lines to scroll.

wxListCtrl::SetBackgroundColour

void SetBackgroundColour(**const wxColour&** *col*)

Sets the background colour (GetBackgroundColour already implicit in wxWindow class).

wxListCtrl::SetColumn

bool SetColumn(**int** *col*, **wxListItem&** *item*)

Sets information about this column. See *wxListCtrl::SetItem* (p. 645) for more information.

wxListCtrl::SetColumnWidth

bool SetColumnWidth(**int** *col*, **int** *width*)

Sets the column width.

width can be a width in pixels or wxLIST_AUTOSIZE (-1) or
wxLIST_AUTOSIZE_USEHEADER (-2). wxLIST_AUTOSIZE will resize the column to
the length of its longest item. wxLIST_AUTOSIZE_USEHEADER will resize the column
to the length of the header (Win32) or 80 pixels (other platforms).

In small or normal icon view, *col* must be -1, and the column width is set for all columns.

wxListCtrl::SetImageList

void SetImageList(**wxImageList*** *imageList*, **int** *which*)

Sets the image list associated with the control. *which* is one of
wxIMAGE_LIST_NORMAL, wxIMAGE_LIST_SMALL, wxIMAGE_LIST_STATE (the last
is unimplemented).

wxListCtrl::SetItem

bool SetItem(**wxListItem&** *info*)

long SetItem(**long** *index*, **int** *col*, **const** *wxString& label*, **int** *imageId = -1*)

Sets information about the item.

wxListItem is a class with the following members:

long m_mask	Indicates which fields are valid. See the list of valid mask flags below.
long m_itemId	The zero-based item position.
int m_col	Zero-based column, if in report mode.
long m_state	The state of the item. See the list of valid state flags below.
long m_stateMask	A mask indicating which state flags are valid. See the list of valid state flags below.
wxString m_text	The label/header text.
int m_image	The zero-based index into an image list.
long m_data	Application-defined data.
int m_format	For columns only: the format. Can be wxLIST_FORMAT_LEFT, wxLIST_FORMAT_RIGHT or wxLIST_FORMAT_CENTRE.
int m_width	For columns only: the column width.

The **m_mask** member contains a bitlist specifying which of the other fields are valid. The
flags are:

wxLIST_MASK_STATE	The **m_state** field is valid.
wxLIST_MASK_TEXT	The **m_text** field is valid.
wxLIST_MASK_IMAGE	The **m_image** field is valid.
wxLIST_MASK_DATA	The **m_data** field is valid.

wxLIST_MASK_WIDTH   The **m_width** field is valid.
wxLIST_MASK_FORMAT   The **m_format** field is valid.

The **m_stateMask** and **m_state** members take flags from the following:

The wxListItem object can also contain item-specific colour and font information: for this you need to call one of SetTextColour(), SetBackgroundColour() or SetFont() functions on it passing it the colour/font to use. If the colour/font is not specified, the default list control colour/font is used.

wxLIST_STATE_DONTCARE   Don't care what the state is. Win32 only.
wxLIST_STATE_DROPHILITED   The item is highlighted to receive a drop event.
                             Win32 only.
wxLIST_STATE_FOCUSED The item has the focus.
wxLIST_STATE_SELECTEDThe item is selected.
wxLIST_STATE_CUT   The item is in the cut state. Win32 only.

long SetItem(**long** *index*, **int** *col*, **const wxString&** *label*, **int** *imageId = -1*)

Sets a string field at a particular column.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

>   **SetItem(item)**   Sets information about the given wxListItem.
>   **SetStringItem(index, col, label, imageId)**   Sets a string or image at a
>   given location.

wxListCtrl::SetItemData

bool SetItemData(**long** *item*, **long** *data*)

Associates application-defined data with this item.

wxListCtrl::SetItemImage

bool SetItemImage(**long** *item*, **int** *image*, **int** *selImage*)

Sets the unselected and selected images associated with the item. The images are indices into the image list associated with the list control.

wxListCtrl::SetItemPosition

bool SetItemPosition(**long** *item*, **const wxPoint&** *pos*)

Sets the position of the item, in icon or small icon view.

wxListCtrl::SetItemState

bool SetItemState(**long** *item*, **long** *state*, **long** *stateMask*)

Sets the item state. For a list of state flags, see *wxListCtrl::SetItem* (p. 645).

The **stateMask** indicates which state flags are valid.

wxListCtrl::SetItemText

void SetItemText(**long** *item*, **const wxString&** *text*)

Sets the item text for this item.

wxListCtrl::SetSingleStyle

void SetSingleStyle(**long** *style*, **const bool** *add = TRUE*)

Adds or removes a single window style.

wxListCtrl::SetTextColour

void SetTextColour(**const wxColour&** *col*)

Sets the text colour of the list control.

wxListCtrl::SetWindowStyleFlag

void SetWindowStyleFlag(**long** *style*)

Sets the whole window style.

wxListCtrl::SortItems

bool SortItems(**wxListCtrlCompare** *fnSortCallBack*, **long** *data*)

Call this function to sort the items in the list control. Sorting is done using the specified *fnSortCallBack* function. This function must have the following prototype:

```
int wxCALLBACK wxListCompareFunction(long item1, long item2, long
sortData)
```

It is called each time when the two items must be compared and should return 0 if the items are equal, negative value if the first item is less than the second one and positive value if the first one is greater than the second one (the same convention as used by `qsort(3)`).

Parameters

item1
>   client data associated with the first item (**NOT** the index).

item2
>   client data associated with the second item (**NOT** the index).

data
>   the value passed to SortItems() itself.

Notice that the control may only be sorted on client data associated with the items, so you **must** use *SetItemData* (p. 646) if you want to be able to sort the items in the control.

Please see the *listctrl sample* (p. 1332) for an example of using this function.

wxPython note: wxPython uses the sortData parameter to pass the Python function to call, so it is not available for programmer use. Call SortItems with a reference to a callable object that expects two parameters.

wxListEvent

A list event holds information about events associated with wxListCtrl objects.

Derived from

wxNotifyEvent (p. 749)
wxCommandEvent (p. 153)
wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/listctrl.h>

Event table macros

To process input from a list control, use these event handler macros to direct input to member functions that take a wxListEvent argument.

EVT_LIST_BEGIN_DRAG(id, func)   Begin dragging with the left mouse button.

EVT_LIST_BEGIN_RDRAG(id, func)   Begin dragging with the right mouse button.
EVT_LIST_BEGIN_LABEL_EDIT(id, func) Begin editing a label. This can be prevented
        by calling *Veto()* (p. 750).
EVT_LIST_END_LABEL_EDIT(id, func)   Finish editing a label. This can be prevented
        by calling *Veto()* (p. 750).
EVT_LIST_DELETE_ITEM(id, func)   Delete an item.
EVT_LIST_DELETE_ALL_ITEMS(id, func) Delete all items.
EVT_LIST_GET_INFO(id, func)   Request information from the application,
        usually the item text.
EVT_LIST_SET_INFO(id, func)   Information is being supplied (not
        implemented).
EVT_LIST_ITEM_SELECTED(id, func) The item has been selected.
EVT_LIST_ITEM_DESELECTED(id, func) The item has been deselected.
EVT_LIST_ITEM_ACTIVATED(id, func) The item has been activated (ENTER or double
        click).
EVT_LIST_KEY_DOWN(id, func)   A key has been pressed.
EVT_LIST_INSERT_ITEM(id, func)   An item has been inserted.
EVT_LIST_COL_CLICK(id, func)   A column (**m_col**) has been left-clicked.

See also

wxListCtrl (p. 634)

wxListEvent::wxListEvent

  wxListEvent(**WXTYPE** *commandType = 0*, **int** *id = 0*)

Constructor.

wxListEvent::GetCode

int GetCode() **const**

Key code if the event is a keypress event.

wxListEvent::GetIndex

long GetIndex() **const**

The item index.

wxListEvent::GetOldIndex

long GetOldIndex() **const**

The old item index.

wxListEvent::GetColumn

int GetColumn() **const**

The column position.

wxListEvent::Cancelled

bool Cancelled() **const**

TRUE if this event is an end edit event and the user cancelled the edit.

wxListEvent::GetPoint

wxPoint GetPoint() **const**

The position of the mouse pointer if the event is a drag event.

wxListEvent::GetLabel

const wxString& GetLabel() **const**

The label.

wxListEvent::GetText

const wxString& GetText() **const**

The text.

wxListEvent::GetImage

int GetImage() **const**

The image.

wxListEvent::GetData

long GetData() **const**

The data.

wxListEvent::GetMask

long GetMask() **const**

The mask.

wxListEvent::GetItem

const wxListItem& GetItem() **const**

An item object, used by some events. See also *wxListCtrl::SetItem* (p. 645).

wxListOfStringsListValidator

This class validates a list of strings for a list view. When editing the property, a dialog box is presented for adding, deleting or editing entries in the list. At present no constraints may be supplied.

You can construct a string list property value by constructing a wxStringList object.

For example:

```
myListValidatorRegistry.RegisterValidator((wxString)"stringlist",
    new wxListOfStringsListValidator);

wxStringList *strings = new wxStringList("earth", "fire", "wind",
"water", NULL);

sheet->AddProperty(new wxProperty("fred", strings, "stringlist"));
```

See also

Validator classes (p. 1463)

wxListOfStringsListValidator::wxListofStringsListValidator

void wxListOfStringsListValidator(**long** *flags=0*)

Constructor.

wxLocale

wxLocale class encapsulates all language-dependent settings and is a generalization of the C locale concept.

In wxWindows this class manages message catalogs which contain the translations of the strings used to the current language.

Derived from

No base class

See also

I18n overview (p. 1353)

Include files

<wx/intl.h>

wxLocale::wxLocale

wxLocale()

This is the default constructor and it does nothing to initialize the object: *Init()* (p. 654) must be used to do that.

wxLocale(**const char** *szName*, **const char** *szShort = NULL*, **const char** *szLocale = NULL*, **bool** *bLoadDefault = TRUE*, **bool** *bConvertEncoding = FALSE*)

The parameters have the following meaning:
- szName is the name of the locale and is only used in diagnostic messages
- szShort is the standard 2 letter locale abbreviation and is used as the directory prefix when looking for the message catalog files
- szLocale is the parameter for the call to setlocale()
- bLoadDefault may be set to FALSE to prevent loading of the message catalog for the given locale containing the translations of standard wxWindows messages. This parameter would be rarely used in normal circumstances.
- bConvertEncoding may be set to TRUE to do automatic conversion of message catalogs to platform's native encoding. Note that it will do only basic conversion between well-known pair like iso8859-1 and windows-1252 or iso8859-2 and windows-1250. See *Writing non-English applications* (p. 1354) for detailed

description of this behaviour.

The call of this function has several global side effects which you should understand: first of all, the application locale is changed - note that this will affect many of standard C library functions such as printf() or strftime(). Second, this wxLocale object becomes the new current global locale for the application and so all subsequent calls to wxGetTranslation() will try to translate the messages using the message catalogs for this locale. Finally, unless bLoadDefault parameter is FALSE, the method also loads the wxstd.mo catalog (which is looked for in all the usual places and, additionally, under the location specified bythe environment variable WXDIR if it is set) which will allow to translate all the messages generated by the library itself.

wxLocale::~wxLocale

~wxLocale()

The destructor, like the constructor, also has global side effects: the previously set locale is restored and so the changes described in *Init* (p. 654) documentation are rolled back.

wxLocale::AddCatalog

bool AddCatalog(**const char** *szDomain*)

Add a catalog for use with the current locale: it is searched for in standard places (current directory first, then the system one), but you may also prepend additional directories to the search path with *AddCatalogLookupPathPrefix()* (p. 653).

All loaded catalogs will be used for message lookup by GetString() for the current locale.

Returns TRUE if catalog was successfully loaded, FALSE otherwise (which might mean that the catalog is not found or that it isn't in the correct format).

wxLocale::AddCatalogLookupPathPrefix

void AddCatalogLookupPathPrefix(**const wxString&** *prefix*)

Add a prefix to the catalog lookup path: the message catalog files will be looked up under prefix/<lang>/LC_MESSAGES, prefix/LC_MESSAGES and prefix (in this order).

This only applies to subsequent invocations of AddCatalog()!

wxLocale::GetLocale

const char* GetLocale() **const**

Returns the locale name as passed to the constructor or *Init()* (p. 654).

wxLocale::GetName

const wxString& GetName() **const**

Returns the current short name for the locale (as given to the constructor or the Init() function).

wxLocale::GetString

const char* GetString(**const char** **szOrigString*, **const char** **szDomain = NULL*) **const**

Retrieves the translation for a string in all loaded domains unless the szDomain parameter is specified (and then only this catalog/domain is searched).

Returns original string if translation is not available (in this case an error message is generated the first time a string is not found; use *wxLogNull* (p. 1360) to suppress it).

Remarks

Domains are searched in the last to first order, i.e. catalogs added later override those added before.

wxLocale::Init

bool Init(**const char** **szName*, **const char** **szShort = NULL*, **const char** **szLocale = NULL*, **bool** *bLoadDefault = TRUE*)

The parameters have the following meaning:

- szName is the name of the locale and is only used in diagnostic messages
- szShort is the standard 2 letter locale abbreviation and is used as the directory prefix when looking for the message catalog files
- szLocale is the parameter for the call to setlocale()
- bLoadDefault may be set to FALSE to prevent loading of the message catalog for the given locale containing the translations of standard wxWindows messages. This parameter would be rarely used in normal circumstances.

The call of this function has several global side effects which you should understand: first of all, the application locale is changed - note that this will affect many of standard C library functions such as printf() or strftime(). Second, this wxLocale object becomes the new current global locale for the application and so all subsequent calls to wxGetTranslation() will try to translate the messages using the message catalogs for this locale.

Returns TRUE on success or FALSE if the given locale couldn't be set.

wxLocale::IsLoaded

bool IsLoaded(**const char*** *domain*) **const**

Check if the given catalog is loaded, and returns TRUE if it is.

According to GNU gettext tradition, each catalog normally corresponds to 'domain' which is more or less the application name.

See also: *AddCatalog* (p. 653)

wxLocale::IsOk

bool IsOk() **const**

Returns TRUE if the locale could be set successfully.

wxLog

wxLog class defines the interface for the *log targets* used by wxWindows logging functions as explained in the *wxLog overview* (p. 1360). The only situations when you need to directly use this class is when you want to derive your own log target because the existing ones don't satisfy your needs. Another case is if you wish to customize the behaviour of the standard logging classes (all of which respect the wxLog settings): for example, set which trace messages are logged and which are not or change (or even remove completely) the timestamp on the messages.

Otherwise, it is completely hidden behind the *wxLogXXX()* functions and you may not even know about its existence.

See *log overview* (p. 1360) for the descriptions of wxWindows logging facilities.

Derived from

No base class

Include files

<wx/log.h>

Static functions

The functions in this section work with and manipulate the active log target. The *OnLog()* is called by the *wxLogXXX()* functions and invokes the *DoLog()* of the active log target if any. Get/Set methods are used to install/query the current active target and, finally, *DontCreateOnDemand()* disables the automatic creation of a standard log target if none actually exists. It is only useful when the application is terminating and shouldn't be used in other situations because it may easily lead to a loss of messages.

OnLog (p. 658)
GetActiveTarget (p. 658)
SetActiveTarget (p. 658)
DontCreateOnDemand (p. 658)

Message buffering

Some of wxLog implementations, most notably the standard wxLogGui class, buffer the messages (for example, to avoid showing the user a zillion of modal message boxes one after another - which would be really annoying). *Flush()* shows them all and clears the buffer contents. Although this function doesn't do anything if the buffer is already empty, *HasPendingMessages()* is also provided which allows to explicitly verify it.

Flush (p. 658)
FlushActive (p. 658)
HasPendingMessages (p. 659)

Customization

The functions below allow some limited customization of wxLog behaviour without writing a new log target class (which, aside of being a matter of several minutes, allows you to do anything you want).

The verbose messages are the trace messages which are not disabled in the release mode and are generated by *wxLogVerbose* (p. 1304). They are not normally shown to the user because they present little interest, but may be activated, for example, in order to help the user find some program problem.

As for the (real) trace messages, their handling depends on the settings of the (application global) *trace mask*. There are two ways to specify it: either by using *SetTraceMask* (p. 659) and *GetTraceMask* (p. 660) and using *wxLogTrace* (p. 1305) which takes an integer mask or by using *AddTraceMask* (p. 657) for string trace masks.

The difference between bit-wise and string trace masks is that a message using integer trace mask will only be logged if all bits of the mask are set in the current mask while a message using string mask will be logged simply if the mask had been added before to the list of allowed ones.

For example,

```
// wxTraceOleCalls is one of standard bit masks
wxLogTrace(wxTraceRefCount | wxTraceOleCalls, "Active object ref count:
%d", nRef);
```

will do something only if the current trace mask contains both `wxTraceRefCount` and `wxTraceOle`, but

```
// wxTRACE_OleCalls is one of standard string masks
wxLogTrace(wxTRACE_OleCalls, "IFoo::Bar() called");
```

will log the message if it was preceded by

```
wxLog::AddTraceMask(wxTRACE_OleCalls);
```

Using string masks is simpler and allows to easily add custom ones, so this is the preferred way of working with trace messages. The integer trace mask is kept for compatibility and for additional (but very rarely needed) flexibility only.

The standard trace masks are given in *wxLogTrace* (p. 1305) documentation.

Finally, the *wxLog::DoLog()* function automatically prepends a time stamp to all the messages. The format of the time stamp may be changed: it can be any string with % specificators fully described in the documentation of the standard *strftime()* function. For example, the default format is "[%d/%b/%y %H:%M:%S] " which gives something like "[17/Sep/98 22:10:16] " (without quotes) for the current date. Setting an empty string as the time format disables timestamping of the messages completely.

NB: Timestamping is disabled for Visual C++ users in debug builds by default because otherwise it would be impossible to directly go to the line from which the log message was generated by simply clicking in the debugger window on the corresponding error message. If you wish to enable it, please use *SetTimestamp* (p. 659) explicitly.

AddTraceMask (p. 657)
RemoveTraceMask (p. 660)
IsAllowedTraceMask (p. 660)
SetVerbose (p. 659)
GetVerbose (p. 659)
SetTimestamp (p. 659)
GetTimestamp (p. 659)
SetTraceMask (p. 659)
GetTraceMask (p. 660)

wxLog::AddTraceMask

static void AddTraceMask(**const wxString&** *mask*)

Add the *mask* to the list of allowed masks for *wxLogTrace* (p. 1305).

See also: *RemoveTraceMask* (p. 660)

wxLog::OnLog

static void OnLog(**wxLogLevel** *level*, **const char *** *message*)

Forwards the message at specified level to the *DoLog()* function of the active log target if there is any, does nothing otherwise.

wxLog::GetActiveTarget

static wxLog * GetActiveTarget()

Returns the pointer to the active log target (may be NULL).

wxLog::SetActiveTarget

static wxLog * SetActiveTarget(**wxLog *** *logtarget*)

Sets the specified log target as the active one. Returns the pointer to the previous active log target (may be NULL).

wxLog::DontCreateOnDemand

static void DontCreateOnDemand()

Instructs wxLog to not create new log targets on the fly if there is none currently. (Almost) for internal use only.

wxLog::Flush

virtual void Flush()

Shows all the messages currently in buffer and clears it. If the buffer is already empty, nothing happens.

wxLog::FlushActive

static void FlushActive()

Flushes the current log target if any, does nothing if there is none.

See also:

Flush (p. 658)

wxLog::HasPendingMessages

bool HasPendingMessages() const

Returns true if there are any messages in the buffer (not yet shown to the user). (Almost) for internal use only.

wxLog::SetVerbose

void SetVerbose(bool *verbose = TRUE*)

Activates or desactivates verbose mode in which the verbose messages are logged as the normal ones instead of being silently dropped.

wxLog::GetVerbose

bool GetVerbose() const

Returns whether the verbose mode is currently active.

wxLog::SetTimestamp

void SetTimestamp(const char * *format*)

Sets the timestamp format prepended by the default log targets to all messages. The string may contain any normal characters as well as %prefixed format specificators, see *strftime()* manual for details. Passing a NULL value (not empty string) to this function disables message timestamping.

wxLog::GetTimestamp

const char * GetTimestamp() const

Returns the current timestamp format string.

wxLog::SetTraceMask

static void SetTraceMask(wxTraceMask *mask*)

Sets the trace mask, see *Customization* (p. 656)section for details.

wxLog::GetTraceMask

Returns the current trace mask, see *Customization* (p. 656) section for details.

wxLog::IsAllowedTraceMask

static bool IsAllowedTraceMask(**const wxChar ****mask*)

Returns TRUE if the *mask* is one of allowed masks for *wxLogTrace* (p. 1305).

See also: *AddTraceMask* (p. 657), *RemoveTraceMask* (p. 660)

wxLog::RemoveTraceMask

static void RemoveTraceMask(**const wxString&** *mask*)

Remove the *mask* from the list of allowed masks for *wxLogTrace* (p. 1305).

See also: *AddTraceMask* (p. 657)

wxLongLong

This class represents a signed 64 bit long number. It is implemented using the native 64 bit type where available (machines with 64 bit longs or compilers which have (an analog of) *long long* type) and uses the emulation code in the other cases which ensures that it is the most efficient solution for working with 64 bit integers independently of the architecture.

wxLongLong defines all usual arithmetic operations such as addition, substraction, bitwise shifts and logical operations as well as multiplication and division (not yet for the machines without native *long long*). It also has operators for implicit construction from and conversion to the native *long long* type if it exists and *long*.

You would usually use this type in exactly the same manner as any other (built-in) arithmetic type. Note that wxLongLong is a signed type.

If a native (i.e. supported directly by the compiler) 64 bit integer type was found a typedef *wxLongLong_t* will be defined to correspond it.

Derived from

No base class

Include files

<wx/longlong.h>

wxLongLong::wxLongLong

wxLongLong()

Default constructor initializes the object to 0.

wxLongLong::wxLongLong

wxLongLong(**wxLongLong_t** *ll*)

Constructor from native long long (only for compilers supporting it).

wxLongLong::wxLongLong

wxLongLong(**long** *hi*, **unsigned long** *lo*)

Constructor from 2 longs: the high and low part are combined into one wxLongLong.

wxLongLong::operator=

wxLongLong& operator operator=(**wxLongLong_t** *ll*)

Assignment operator from native long long (only for compilers supporting it).

wxLongLong::Abs

wxLongLong Abs() **const**

wxLongLong& Abs()

Returns an absolute value of wxLongLong - either making a copy (const version) or modifying it in place (the second one).

wxLongLong::Assign

wxLongLong& Assign(**double** *d*)

This allows to convert a double value to wxLongLong type. Such conversion is not always possible in which case the result will be silently truncated in a platform-dependent way.

wxLongLong::GetHi

long GetHi() **const**

Returnes the high 32 bits of 64 bit integer.

wxLongLong::GetLo

unsigned long GetLo() **const**

Returnes the low 32 bits of 64 bit integer.

wxLongLong::GetValue

wxLongLong_t GetValue() **const**

Convert to native long long (only for compilers supporting it)

wxLongLong::ToLong

long ToLong() **const**

Truncate wxLongLong to long. If the conversion loses data (i.e. the wxLongLong value is outside the range of built-in long type), an assert will be triggered in debug mode.

wxLongLong::operator+

wxLongLong operator+(**const wxLongLong&** *ll*) **const**

Adds 2 wxLongLongs together and returns the result.

wxLongLong::operator+=

wxLongLong& operator+(**const wxLongLong&** *ll*)

Add another wxLongLong to this one.

wxLongLong::operator++

wxLongLong& operator++()

wxLongLong& operator++(**int**)

Pre/post increment operator.

wxLongLong::operator-

wxLongLong operator-() **const**

Returns the value of this wxLongLong with opposite sign.

wxLongLong::operator-

wxLongLong operator-(**const wxLongLong&** *ll*) **const**

Substracts 2 wxLongLongs and returns the result.

wxLongLong::operator-=

wxLongLong& operator-(**const wxLongLong&** *ll*)

Substracts another wxLongLong from this one.

wxLongLong::operator--

wxLongLong& operator--()

wxLongLong& operator--(**int**)

Pre/post decrement operator.

wxMask

This class encapsulates a monochrome mask bitmap, where the masked area is black and the unmasked area is white. When associated with a bitmap and drawn in a device context, the unmasked area of the bitmap will be drawn, and the masked area will not be drawn.

Derived from

wxObject (p. 750)

Include files

<wx/bitmap.h>

Remarks

A mask may be associated with a *wxBitmap* (p. 54). It is used in *wxDC::Blit* (p. 283) when the source device context is a *wxMemoryDC* (p. 682) with wxBitmap selected into it that contains a mask.

See also

wxBitmap (p. 54), *wxDC::Blit* (p. 283), *wxMemoryDC* (p. 682)

wxMask::wxMask

wxMask()

Default constructor.

wxMask(**const wxBitmap&** *bitmap*)

Constructs a mask from a monochrome bitmap.

wxPython note: This is the default constructor for wxMask in wxPython.

wxMask(**const wxBitmap&** *bitmap*, **const wxColour&** *colour*)

Constructs a mask from a bitmap and a colour that indicates the background.

wxPython note: wxPython has an alternate wxMask constructor matching this form called wxMaskColour.

wxMask(**const wxBitmap&** *bitmap*, **int** *index*)

Constructs a mask from a bitmap and a palette index that indicates the background. Not yet implemented for GTK.

Parameters

bitmap
     A valid bitmap.

colour
     A colour specifying the transparency RGB values.

index
>   Index into a palette, specifying the transparency colour.

wxMask::~wxMask

~wxMask()

Destroys the wxMask object and the underlying bitmap data.

wxMask::Create

bool Create(**const wxBitmap&** *bitmap*)

Constructs a mask from a monochrome bitmap.

bool Create(**const wxBitmap&** *bitmap*, **const wxColour&** *colour*)

Constructs a mask from a bitmap and a colour that indicates the background.

bool Create(**const wxBitmap&** *bitmap*, **int** *index*)

Constructs a mask from a bitmap and a palette index that indicates the background. Not yet implemented for GTK.

Parameters

bitmap
>   A valid bitmap.

colour
>   A colour specifying the transparency RGB values.

index
>   Index into a palette, specifying the transparency colour.

wxMBConv

This class is the base class of a hierarchy of classes capable of converting text strings between multibyte (SBCS or DBCS) encodings and Unicode. It is itself a wrapper around the standard libc mbstowcs() and wcstombs() routines, and has one predefined instance, **wxConvLibc**.

Derived from

No base class

Include files

<wx/strconv.h>

See also

wxCSConv (p. 181), *wxEncodingConverter* (p. 373), *wxMBConv classes overview* (p. 1350)

wxMBConv::wxMBConv

 wxMBConv ()

Constructor.

wxMBConv::MB2WC

virtual size_t MB2WC(**wchar_t*** *buf*, **const char*** *psz,* **size_t** *n*) **const**

Converts from multibyte encoding to Unicode, using the libc routine mbstowcs() (this is overridden by derived classes). Returns the size of the destination buffer.

wxMBConv::WC2MB

virtual size_t WC2MB(**char*** *buf*, **const wchar_t*** *psz,* **size_t** *n*) **const**

Converts from Unicode to multibyte encoding, using the libc routine wcstombs() (this is overridden by derived classes). Returns the size of the destination buffer.

wxMBConv::cMB2WC

const wxWCharBuffer cMB2WC(**const char*** *psz*) **const**

Converts from multibyte encoding to Unicode by calling MB2WC, allocating a temporary wxWCharBuffer to hold the result.

wxMBConv::cWC2MB

const wxCharBuffer cWC2MB(**const wchar_t*** *psz*) **const**

Converts from Unicode to multibyte encoding by calling WC2MB, allocating a temporary

wxCharBuffer to hold the result.

wxMBConv::cMB2WX

const char* cMB2WX(**const char*** *psz*) **const**

const wxWCharBuffer cMB2WX(**const char*** *psz*) **const**

Converts from multibyte encoding to the current wxChar type (which depends on whether wxUSE_UNICODE is set to 1). If wxChar is char, it returns the parameter unaltered. If wxChar is wchar_t, it returns the result in a wxWCharBuffer. The macro wxMB2WXbuf is defined as the correct return type (without const).

wxMBConv::cWX2MB

const char* cWX2MB(**const wxChar*** *psz*) **const**

const wxCharBuffer cWX2MB(**const wxChar*** *psz*) **const**

Converts from the current wxChar type to multibyte encoding. If wxChar is char, it returns the parameter unaltered. If wxChar is wchar_t, it returns the result in a wxCharBuffer. The macro wxWX2MBbuf is defined as the correct return type (without const).

wxMBConv::cWC2WX

const wchar_t* cWC2WX(**const wchar_t*** *psz*) **const**

const wxCharBuffer cWC2WX(**const wchar_t*** *psz*) **const**

Converts from Unicode to the current wxChar type. If wxChar is wchar_t, it returns the parameter unaltered. If wxChar is char, it returns the result in a wxCharBuffer. The macro wxWC2WXbuf is defined as the correct return type (without const).

wxMBConv::cWX2WC

const wchar_t* cWX2WC(**const wxChar*** *psz*) **const**

const wxWCharBuffer cWX2WC(**const wxChar*** *psz*) **const**

Converts from the current wxChar type to Unicode. If wxChar is wchar_t, it returns the parameter unaltered. If wxChar is char, it returns the result in a wxWCharBuffer. The macro wxWX2WCbuf is defined as the correct return type (without const).

wxMBConvFile

This class converts file names between filesystem multibyte encoding and Unicode. It has one predefined instance, **wxConvFile**. Since some platforms (e.g. Win32) use Unicode in the filenames, and others (e.g. Unix) use multibyte encodings, this class should only be used directly if wxMBFILES is defined to 1. A convenience macro, wxFNCONV, is defined to wxConvFile.cWX2MB in this case. You could use it like this:

```
wxChar *name = wxT("rawfile.doc");
FILE *fil = fopen(wxFNCONV(name), "r");
```

(although it would be better to use wxFopen(name, wxT("r")) in this case.)

Derived from

wxMBConv (p. 665)

Include files

<wx/strconv.h>

See also

wxMBConv classes overview (p. 1350)

wxMBConvFile::MB2WC

size_t MB2WC(**wchar_t*** *buf*, **const char*** *psz*, **size_t** *n*) **const**

Converts from multibyte filename encoding to Unicode. Returns the size of the destination buffer.

wxMBConvFile::WC2MB

size_t WC2MB(**char*** *buf*, **const wchar_t*** *psz*, **size_t** *n*) **const**

Converts from Unicode to multibyte filename encoding. Returns the size of the destination buffer.

wxMBConvUTF7

This class converts between the UTF-7 encoding and Unicode. It has one predefined instance, **wxConvUTF7**. Unfortunately, this class is not quite implemented yet.

Derived from

wxMBConv (p. 665)

Include files

<wx/strconv.h>

See also

wxMBConvUTF8 (p. 669), *wxMBConv classes overview* (p. 1350)

wxMBConvUTF7::MB2WC

size_t MB2WC(**wchar_t*** *buf*, **const char*** *psz*, **size_t** *n*) **const**

Converts from UTF-7 encoding to Unicode. Returns the size of the destination buffer.

wxMBConvUTF7::WC2MB

size_t WC2MB(**char*** *buf*, **const wchar_t*** *psz*, **size_t** *n*) **const**

Converts from Unicode to UTF-7 encoding. Returns the size of the destination buffer.

wxMBConvUTF8

This class converts between the UTF-8 encoding and Unicode. It has one predefined instance, **wxConvUTF8**.

Derived from

wxMBConv (p. 665)

Include files

<wx/strconv.h>

See also

wxMBConvUTF7 (p. 668), *wxMBConv classes overview* (p. 1350)

Remarks

UTF-8 is a compatibility encoding used to encode Unicode text into anything that was originally written for 8-bit strings, including (but not limited to) filenames, transfer protocols, and database fields. Notable properties include:

- Variable-length encoding able to encode up to 31 bits per character

- ASCII characters (character values under 128) are encoded as plain ASCII (1 byte per character)

- Null bytes do not occur in the encoding, except when there's an actual Unicode null character

- Preserves sort ordering for plain 8-bit comparison routines like strcmp()

- High bit patterns unambiguates character boundaries, and makes it easy to detect whether a string is encoded with UTF-8 or not

All of these properties make UTF-8 a very favorable solution in any situation where full Unicode character support is desired while remaining compatible with code written with only 8-bit extended-ASCII characters in mind.

wxMBConvUTF8::MB2WC

size_t MB2WC(**wchar_t*** *buf*, **const char*** *psz*, **size_t** *n*) **const**

Converts from UTF-8 encoding to Unicode. Returns the size of the destination buffer.

wxMBConvUTF8::WC2MB

size_t WC2MB(**char*** *buf*, **const wchar_t*** *psz*, **size_t** *n*) **const**

Converts from Unicode to UTF-8 encoding. Returns the size of the destination buffer.

wxMDIChildFrame

An MDI child frame is a frame that can only exist on a *wxMDIClientWindow* (p. 674), which is itself a child of *wxMDIParentFrame* (p. 675).

Derived from

wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/mdi.h>

Window styles

wxCAPTION	Puts a caption on the frame.
wxDEFAULT_FRAME_STYLE	Defined as **wxMINIMIZE_BOX | wxMAXIMIZE_BOX | wxTHICK_FRAME | wxSYSTEM_MENU | wxCAPTION**.
wxICONIZE	Display the frame iconized (minimized) (Windows only).
wxMAXIMIZE	Displays the frame maximized (Windows only).
wxMAXIMIZE_BOX	Displays a maximize box on the frame (Windows and Motif only).
wxMINIMIZE	Identical to **wxICONIZE**.
wxMINIMIZE_BOX	Displays a minimize box on the frame (Windows and Motif only).
wxRESIZE_BORDER	Displays a resizeable border around the window (Motif only; for Windows, it is implicit in wxTHICK_FRAME).
wxSTAY_ON_TOP	Stay on top of other windows (Windows only).
wxSYSTEM_MENU	Displays a system menu (Windows and Motif only).
wxTHICK_FRAME	Displays a thick frame around the window (Windows and Motif only).

See also *window styles overview* (p. 1379).

Remarks

Although internally an MDI child frame is a child of the MDI client window, in wxWindows you create it as a child of *wxMDIParentFrame* (p. 675). You can usually forget that the client window exists.

MDI child frames are clipped to the area of the MDI client window, and may be iconized on the client window.

You can associate a menubar with a child frame as usual, although an MDI child doesn't display its menubar under its own title bar. The MDI parent frame's menubar will be changed to reflect the currently active child frame. If there are currently no children, the parent frame's own menubar will be displayed.

See also

wxMDIClientWindow (p. 674), *wxMDIParentFrame* (p. 675), *wxFrame* (p. 454)

wxMDIChildFrame::wxMDIChildFrame

wxMDIChildFrame ()

Default constructor.

wxMDIChildFrame (**wxMDIParentFrame*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxDEFAULT_FRAME_STYLE,* **const wxString&** *name = "frame"*)

Constructor, creating the window.

Parameters

parent
 The window parent. This should not be NULL.

id
 The window identifier. It may take a value of -1 to indicate a default value.

title
 The caption to be displayed on the frame's title bar.

pos
 The window position. A value of (-1, -1) indicates a default position, chosen by either the windowing system or wxWindows, depending on platform.

size
 The window size. A value of (-1, -1) indicates a default size, chosen by either the windowing system or wxWindows, depending on platform.

style
 The window style. See *wxMDIChildFrame* (p. 670).

name
 The name of the window. This parameter is used to associate a name with the item, allowing the application user to set Motif resource values for individual windows.

Remarks

None.

See also

wxMDIChildFrame::Create (p. 673)

wxMDIChildFrame::~wxMDIChildFrame

~wxMDIChildFrame ()

Destructor. Destroys all child windows and menu bar if present.

wxMDIChildFrame::Activate

void Activate()

Activates this MDI child frame.

See also

wxMDIChildFrame::Maximize (p. 673), *wxMDIChildFrame::Restore* (p. 673)

wxMDIChildFrame::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE*, **const wxString&** *name* = *"frame"*)

Used in two-step frame construction. See *wxMDIChildFrame::wxMDIChildFrame* (p. 672) for further details.

wxMDIChildFrame::Maximize

void Maximize()

Maximizes this MDI child frame.

See also

wxMDIChildFrame::Activate (p. 673), *wxMDIChildFrame::Restore* (p. 673)

wxMDIChildFrame::Restore

void Restore()

Restores this MDI child frame (unmaximizes).

See also

wxMDIChildFrame::Activate (p. 673), *wxMDIChildFrame::Maximize* (p. 673)

wxMDIClientWindow

An MDI client window is a child of *wxMDIParentFrame* (p. 675), and manages zero or more *wxMDIChildFrame* (p. 670) objects.

Derived from

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/mdi.h>

Remarks

The client window is the area where MDI child windows exist. It doesn't have to cover the whole parent frame; other windows such as toolbars and a help window might coexist with it. There can be scrollbars on a client window, which are controlled by the parent window style.

The **wxMDIClientWindow** class is usually adequate without further derivation, and it is created automatically when the MDI parent frame is created. If the application needs to derive a new class, the function *wxMDIParentFrame::OnCreateClient* (p. 681) must be overridden in order to give an opportunity to use a different class of client window.

Under Windows 95, the client window will automatically have a sunken border style when the active child is not maximized, and no border style when a child is maximized.

See also

wxMDIChildFrame (p. 670), *wxMDIParentFrame* (p. 675), *wxFrame* (p. 454)

wxMDIClientWindow::wxMDIClientWindow

wxMDIClientWindow()

Default constructor.

wxMDIClientWindow(**wxMDIParentFrame*** *parent*, **long** *style = 0*)

Constructor, creating the window.

Parameters

parent
> The window parent.

style
> The window style. Currently unused.

Remarks

The second style of constructor is called within *wxMDIParentFrame::OnCreateClient* (p. 681).

See also

wxMDIParentFrame::wxMDIParentFrame (p. 677), *wxMDIParentFrame::OnCreateClient* (p. 681)

wxMDIClientWindow::~wxMDIClientWindow

~wxMDIClientWindow()

Destructor.

wxMDIClientWindow::CreateClient

bool CreateClient(**wxMDIParentFrame*** *parent*, **long** *style = 0*)

Used in two-step frame construction. See *wxMDIClientWindow::wxMDIClientWindow* (p. 674) for further details.

wxMDIParentFrame

An MDI (Multiple Document Interface) parent frame is a window which can contain MDI child frames in its own 'desktop'. It is a convenient way to avoid window clutter, and is used in many popular Windows applications, such as Microsoft Word(TM).

Derived from

wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/mdi.h>

Remarks

There may be multiple MDI parent frames in a single application, but this probably only makes sense within programming development environments.

Child frames may be either *wxMDIChildFrame* (p. 670), or *wxFrame* (p. 454).

An MDI parent frame always has a *wxMDIClientWindow* (p. 674) associated with it, which is the parent for MDI client frames. This client window may be resized to accommodate non-MDI windows, as seen in Microsoft Visual C++ (TM) and Microsoft Publisher (TM), where a documentation window is placed to one side of the workspace.

MDI remains popular despite dire warnings from Microsoft itself that MDI is an obsolete user interface style.

The implementation is native in Windows, and simulated under Motif. Under Motif, the child window frames will often have a different appearance from other frames because the window decorations are simulated.

Window styles

wxCAPTION	Puts a caption on the frame.
wxDEFAULT_FRAME_STYLE	Defined as **wxMINIMIZE_BOX | wxMAXIMIZE_BOX | wxTHICK_FRAME | wxSYSTEM_MENU | wxCAPTION**.
wxHSCROLL	Displays a horizontal scrollbar in the *client window*, allowing the user to view child frames that are off the current view.
wxICONIZE	Display the frame iconized (minimized) (Windows only).
wxMAXIMIZE	Displays the frame maximized (Windows only).
wxMAXIMIZE_BOX	Displays a maximize box on the frame (Windows and Motif only).
wxMINIMIZE	Identical to **wxICONIZE**.
wxMINIMIZE_BOX	Displays a minimize box on the frame (Windows and Motif only).
wxRESIZE_BORDER	Displays a resizeable border around the window (Motif only; for Windows, it is implicit in wxTHICK_FRAME).
wxSTAY_ON_TOP	Stay on top of other windows (Windows only).
wxSYSTEM_MENU	Displays a system menu (Windows and Motif only).
wxTHICK_FRAME	Displays a thick frame around the window (Windows and Motif only).
wxVSCROLL	Displays a vertical scrollbar in the *client window*, allowing the user to view child frames that are off the current view.
wxFRAME_NO_WINDOW_MENU	Under Windows, removes the Window menu that is normally added automatically.

See also *window styles overview* (p. 1379).

See also

wxMDIChildFrame (p. 670), *wxMDIClientWindow* (p. 674), *wxFrame* (p. 454), *wxDialog* (p. 312)

wxMDIParentFrame::wxMDIParentFrame

wxMDIParentFrame()

Default constructor.

wxMDIParentFrame (**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE | wxVSCROLL | wxHSCROLL*, **const wxString&** *name* = *"frame"*)

Constructor, creating the window.

Parameters

parent
> The window parent. This should be NULL.

id
> The window identifier. It may take a value of -1 to indicate a default value.

title
> The caption to be displayed on the frame's title bar.

pos
> The window position. A value of (-1, -1) indicates a default position, chosen by either the windowing system or wxWindows, depending on platform.

size
> The window size. A value of (-1, -1) indicates a default size, chosen by either the windowing system or wxWindows, depending on platform.

style
> The window style. See *wxMDIParentFrame* (p. 675).

name
> The name of the window. This parameter is used to associate a name with the item, allowing the application user to set Motif resource values for individual windows.

Remarks

During the construction of the frame, the client window will be created. To use a different class from *wxMDIClientWindow* (p. 674), override *wxMDIParentFrame::OnCreateClient*

(p. 681).

Under Windows 95, the client window will automatically have a sunken border style when the active child is not maximized, and no border style when a child is maximized.

See also

wxMDIParentFrame::Create (p. 679), *wxMDIParentFrame::OnCreateClient* (p. 681)

wxMDIParentFrame::~wxMDIParentFrame

~wxMDIParentFrame()

Destructor. Destroys all child windows and menu bar if present.

wxMDIParentFrame::ActivateNext

void ActivateNext()

Activates the MDI child following the currently active one.

See also

wxMDIParentFrame::ActivatePrevious (p. 678)

wxMDIParentFrame::ActivatePrevious

void ActivatePrevious()

Activates the MDI child preceding the currently active one.

See also

wxMDIParentFrame::ActivateNext (p. 678)

wxMDIParentFrame::ArrangeIcons

void ArrangeIcons()

Arranges any iconized (minimized) MDI child windows.

See also

wxMDIParentFrame::Cascade (p. 679), *wxMDIParentFrame::Tile* (p. 682)

wxMDIParentFrame::Cascade

void Cascade()

Arranges the MDI child windows in a cascade.

See also

wxMDIParentFrame::Tile (p. 682), *wxMDIParentFrame::ArrangeIcons* (p. 678)

wxMDIParentFrame::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE | wxVSCROLL | wxHSCROLL*, **const wxString&** *name* = *"frame"*)

Used in two-step frame construction. See *wxMDIParentFrame::wxMDIParentFrame* (p. 677) for further details.

wxMDIParentFrame::GetClientSize

virtual void GetClientSize(**int*** *width*, **int*** *height*) **const**

This gets the size of the frame 'client area' in pixels.

Parameters

width
      Receives the client width in pixels.

height
      Receives the client height in pixels.

Remarks

The client area is the area which may be drawn on by the programmer, excluding title bar, border, status bar, and toolbar if present.

If you wish to manage your own toolbar (or perhaps you have more than one), provide an **OnSize** event handler. Call **GetClientSize** to find how much space there is for your windows and don't forget to set the size and position of the MDI client window as well as your toolbar and other windows (but not the status bar).

If you have set a toolbar with *wxMDIParentFrame::SetToolbar* (p. 681), the client size returned will have subtracted the toolbar height. However, the available positions for the client window and other windows of the frame do not start at zero - you must add the toolbar height.

The position and size of the status bar and toolbar (if known to the frame) are always managed by **wxMDIParentFrame**, regardless of what behaviour is defined in your **OnSize** event handler. However, the client window position and size are always set in **OnSize**, so if you override this event handler, make sure you deal with the client window.

You do not have to manage the size and position of MDI child windows, since they are managed automatically by the client window.

See also

wxMDIParentFrame::GetToolBar (p. 680), *wxMDIParentFrame::SetToolBar* (p. 681), *wxWindow* (p. 1222), *wxMDIClientWindow* (p. 674)

wxPython note: The wxPython version of this method takes no arguments and returns a tuple containing width and height.

wxMDIParentFrame::GetActiveChild

wxMDIChildFrame* GetActiveChild() const

Returns a pointer to the active MDI child, if there is one.

wxMDIParentFrame::GetClientWindow

wxMDIClientWindow* GetClientWindow() const

Returns a pointer to the client window.

See also

wxMDIParentFrame::OnCreateClient (p. 681)

wxMDIParentFrame::GetToolBar

virtual wxWindow* GetToolBar() const

Returns the window being used as the toolbar for this frame.

See also

wxMDIParentFrame::SetToolBar (p. 681)

wxMDIParentFrame::GetWindowMenu

wxMenu* GetWindowMenu() const

Returns the current Window menu (added by wxWindows to the menubar). This function is available under Windows only.

wxMDIParentFrame::OnCreateClient

virtual wxMDIClientWindow* OnCreateClient()

Override this to return a different kind of client window. If you override this function, you must create your parent frame in two stages, or your function will never be called, due to the way C++ treats virtual functions called from constructors. For example:

```
frame = new MyParentFrame;
frame->Create(parent, myParentFrameId, wxT("My Parent Frame"));
```

Remarks

You might wish to derive from *wxMDIClientWindow* (p. 674) in order to implement different erase behaviour, for example, such as painting a bitmap on the background.

Note that it is probably impossible to have a client window that scrolls as well as painting a bitmap or pattern, since in **OnScroll**, the scrollbar positions always return zero. (Solutions to: julian.smart@btopenworld.com).

See also

wxMDIParentFrame::GetClientWindow (p. 680), *wxMDIClientWindow* (p. 674)

wxMDIParentFrame::SetToolBar

virtual void SetToolBar(**wxWindow*** *toolbar*)

Sets the window to be used as a toolbar for this MDI parent window. It saves the application having to manage the positioning of the toolbar MDI client window.

Parameters

toolbar
    Toolbar to manage.

Remarks

When the frame is resized, the toolbar is resized to be the width of the frame client area, and the toolbar height is kept the same.

The parent of the toolbar must be this frame.

If you wish to manage your own toolbar (or perhaps you have more than one), don't call

this function, and instead manage your subwindows and the MDI client window by providing an **OnSize** event handler. Call *wxMDIParentFrame::GetClientSize* (p. 679) to find how much space there is for your windows.

Note that SDI (normal) frames and MDI child windows must always have their toolbars managed by the application.

See also

wxMDIParentFrame::GetToolBar (p. 680), *wxMDIParentFrame::GetClientSize* (p. 679)

wxMDIParentFrame::SetWindowMenu

void SetWindowMenu(**wxMenu*** *menu*)

Call this to change the current Window menu. Ownership of the menu object passes to the frame when you call this function.

This call is available under Windows only.

To remove the window completely, use the wxFRAME_NO_WINDOW_MENU window style.

wxMDIParentFrame::Tile

void Tile()

Tiles the MDI child windows.

See also

wxMDIParentFrame::Cascade (p. 679), *wxMDIParentFrame::ArrangeIcons* (p. 678)

wxMemoryDC

A memory device context provides a means to draw graphics onto a bitmap. When drawing in to a mono-bitmap, using wxWHITE, wxWHITE_PEN and wxWHITE_BRUSH will draw the background colour (i.e. 0) whereas all other colours will draw the foreground colour (i.e. 1).

Derived from

wxDC (p. 282)
wxObject (p. 750)

Include files

<wx/dcmemory.h>

Remarks

A bitmap must be selected into the new memory DC before it may be used for anything. Typical usage is as follows:

```
// Create a memory DC
wxMemoryDC temp_dc;
temp_dc.SelectObject(test_bitmap);

// We can now draw into the memory DC...
// Copy from this DC to another DC.
old_dc.Blit(250, 50, BITMAP_WIDTH, BITMAP_HEIGHT, temp_dc, 0, 0);
```

Note that the memory DC *must* be deleted (or the bitmap selected out of it) before a bitmap can be reselected into another memory DC.

See also

wxBitmap (p. 54), *wxDC* (p. 282)

wxMemoryDC::wxMemoryDC

wxMemoryDC()

Constructs a new memory device context.

Use the *Ok* member to test whether the constructor was successful in creating a useable device context. Don't forget to select a bitmap into the DC before drawing on it.

wxMemoryDC::SelectObject

SelectObject(**const wxBitmap&** *bitmap*)

Selects the given bitmap into the device context, to use as the memory bitmap. Selecting the bitmap into a memory DC allows you to draw into the DC (and therefore the bitmap) and also to use **Blit** to copy the bitmap to a window. For this purpose, you may find *wxDC::DrawIcon* (p. 287) easier to use instead.

If the argument is wxNullBitmap (or some other uninitialised wxBitmap) the current bitmap is selected out of the device context, and the original bitmap restored, allowing the current bitmap to be destroyed safely.

wxMemoryFSHandler

This *wxFileSystem* (p. 425) handler can store arbitrary data in memory stream and make them accessible via URL. It is particularly suitable for storing bitmaps from resources or included XPM files so that they can be used with wxHTML.

Filenames are prefixed with "memory:", e.g. "memory:myfile.html".

Example:

```
#ifndef __WXMSW__
#include "logo.xpm"
#endif

void MyFrame::OnAbout(wxCommandEvent&)
{
    wxBusyCursor bcur;

    wxMemoryFSHandler::AddFile("logo.pcx", wxBITMAP(logo),
wxBITMAP_TYPE_PCX);
    wxMemoryFSHandler::AddFile("about.htm",
                              "<html><body>About: "
                              "<img
src=\"memory:logo.pcx\"></body></html>");

    wxDialog dlg(this, -1, wxString(_("About")));
    wxBoxSizer *topsizer;
    wxHtmlWindow *html;
    topsizer = new wxBoxSizer(wxVERTICAL);
    html = new wxHtmlWindow(&dlg, -1, wxDefaultPosition,
                            wxSize(380, 160), wxHW_SCROLLBAR_NEVER);
    html->SetBorders(0);
    html->LoadPage("memory:about.htm");
    html->SetSize(html->GetInternalRepresentation()->GetWidth(),
                  html->GetInternalRepresentation()->GetHeight());
    topsizer->Add(html, 1, wxALL, 10);
    topsizer->Add(new wxStaticLine(&dlg, -1), 0, wxEXPAND | wxLEFT |
wxRIGHT, 10);
    topsizer->Add(new wxButton(&dlg, wxID_OK, "Ok"),
                  0, wxALL | wxALIGN_RIGHT, 15);
    dlg.SetAutoLayout(true);
    dlg.SetSizer(topsizer);
    topsizer->Fit(&dlg);
    dlg.Centre();
    dlg.ShowModal();

    wxMemoryFSHandler::RemoveFile("logo.pcx");
    wxMemoryFSHandler::RemoveFile("about.htm");
}
```

Derived from

wxFileSystemHandler (p. 427)

Include files

<wx/fs_mem.h>

wxMemoryFSHandler::wxMemoryFSHandler

 wxMemoryFSHandler()

Constructor.

wxMemoryFSHandler::AddFile

static void AddFile(**const wxString&** *filename*, **wxImage&** *image*, **long** *type*)

static void AddFile(**const wxString&** *filename*, **const wxBitmap&** *bitmap*, **long** *type*)

static void AddFile(**const wxString&** *filename*, **const wxString&** *textdata*)

static void AddFile(**const wxString&** *filename*, **const void*** *binarydata*, **size_t** *size*)

Add file to list of files stored in memory. Stored data (bitmap, text or raw data) will be copied into private memory stream and available under name "memory:" + filename.

Note that when storing image/bitmap, you must use image format that wxWindows can write (e.g. JPG, PNG, see *wxImage documentation* (p. 569))!

wxMemoryFSHandler::RemoveFile

static void RemoveFile(**const wxString&** *filename*)

Remove file from memory FS and free occupied memory.

wxMemoryInputStream

Derived from

wxInputStream (p. 595)

Include files

<wx/mstream.h>

See also

wxStreamBuffer (p. 1005), *wxMemoryOutputStream* (p. 686)

wxMemoryInputStream::wxMemoryInputStream

wxMemoryInputStream(**const char *** *data*, **size_t** *len*)

Initializes a new read-only memory stream which will use the specified buffer*data* of length *len*. The stream does not take ownership of the buffer, i.e. that it will not delete in its destructor.

wxMemoryInputStream::~wxMemoryInputStream

~wxMemoryInputStream()

Destructor.

wxMemoryOutputStream

Derived from

wxOutputStream (p. 755)

Include files

<wx/mstream.h>

See also

wxStreamBuffer (p. 1005)

wxMemoryOutputStream::wxMemoryOutputStream

wxMemoryOutputStream(**char *** *data = NULL*, **size_t** *length = 0*)

If *data* is NULL, then it will initialize a new empty buffer which will grow if required.

Warning

If the buffer is created, it will be destroyed at the destruction of the stream.

wxMemoryOutputStream::~wxMemoryOutputStream

~wxMemoryOutputStream()

Destructor.

wxMemoryOutputStream::CopyTo

size_t CopyTo(**char** *buffer, **size_t** *len*) **const**

CopyTo allowed you to transfer data from the internal buffer of wxMemoryOutputStream to an external buffer. *len* specifies the size of the buffer.

Returned value

CopyTo returns the number of bytes copied to the buffer. Generally it is either len or the size of the stream buffer.

wxMenu

A menu is a popup (or pull down) list of items, one of which may be selected before the menu goes away (clicking elsewhere dismisses the menu). Menus may be used to construct either menu bars or popup menus.

A menu item has an integer ID associated with it which can be used to identify the selection, or to change the menu item in some way.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/menu.h>

Event handling

If the menu is part of a menubar, then *wxMenuBar* (p. 697) event processing is used.

With a popup menu, there is a variety of ways to handle a menu selection event (wxEVT_COMMAND_MENU_SELECTED).

1. Derive a new class from wxMenu and define event table entries using the EVT_MENU macro.
2. Set a new event handler for wxMenu, using an object whose class has EVT_MENU entries.
3. Provide EVT_MENU handlers in the window which pops up the menu, or in an ancestor of this window.
4. Define a callback of type wxFunction, which you pass to the wxMenu constructor. The callback takes a reference to the menu, and a reference to a *wxCommandEvent* (p. 153). This method is deprecated and should not be used in the new code, it is provided for backwards compatibility only.

See also

wxMenuBar (p. 697), *wxWindow::PopupMenu* (p. 1223), *Event handling overview* (p. 1372)

wxMenu::wxMenu

wxMenu(**const wxString&** *title = ""*, **long** *style = 0*)

Constructs a wxMenu object.

Parameters

title
A title for the popup menu: the empty string denotes no title.

style
If set to wxMENU_TEAROFF, the menu will be detachable.

wxMenu(**long** *style*)

Constructs a wxMenu object.

Parameters

style
If set to wxMENU_TEAROFF, the menu will be detachable.

wxMenu::~wxMenu

~wxMenu()

Destructor, destroying the menu.

Note: under Motif, a popup menu must have a valid parent (the window it was last popped up on) when being destroyed. Therefore, make sure you delete or re-use the popup menu *before* destroying the parent window. Re-use in this context means popping up the menu on a different window from last time, which causes an implicit destruction and recreation of internal data structures.

wxMenu::Append

void Append(**int** *id*, **const wxString&** *item*, **const wxString&** *helpString = ""*, **const bool** *checkable = FALSE*)

Adds a string item to the end of the menu.

void Append(**int** *id*, **const wxString&** *item*, **wxMenu** *subMenu, **const wxString&** *helpString = ""*)

Adds a pull-right submenu to the end of the menu.

void Append(**wxMenuItem*** *menuItem*)

Adds a menu item object. This is the most generic variant of Append() method because it may be used for both items (including separators) and submenus and because you can also specify various extra properties of a menu item this way, such as bitmaps and fonts.

Parameters

id
> The menu command identifier.

item
> The string to appear on the menu item.

menu
> Pull-right submenu.

checkable
> If TRUE, this item is checkable.

helpString
> An optional help string associated with the item. By default, *wxFrame::OnMenuHighlight* (p. 463) displays this string in the status line.

menuItem
> A menuitem object. It will be owned by the wxMenu object after this function is called, so do not delete it yourself.

Remarks

This command can be used after the menu has been shown, as well as on initial

creation of a menu or menubar.

See also

wxMenu::AppendSeparator (p. 690), *wxMenu::Insert* (p. 694), *wxMenu::SetLabel* (p. 696), *wxMenu::GetHelpString* (p. 693), *wxMenu::SetHelpString* (p. 696), *wxMenuItem* (p. 706)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **Append(id, string, helpStr="", checkable=FALSE)**
>
> **AppendMenu(id, string, aMenu, helpStr="")**
>
> **AppendItem(aMenuItem)**

wxMenu::AppendSeparator

void AppendSeparator()

Adds a separator to the end of the menu.

See also

wxMenu::Append (p. 689)

wxMenu::Break

void Break()

Inserts a break in a menu, causing the next appended item to appear in a new column.

wxMenu::Check

void Check(**int** *id*, **const bool** *check*)

Checks or unchecks the menu item.

Parameters

id
    The menu item identifier.

check
    If TRUE, the item will be checked, otherwise it will be unchecked.

See also

wxMenu::IsChecked (p. 694)

wxMenu::Delete

void Delete(**int** *id*)

void Delete(**wxMenuItem** *item)

Deletes the menu item from the menu. If the item is a submenu, it will**not** be deleted. Use *Destroy* (p. 691) if you want to delete a submenu.

Parameters

id
    Id of the menu item to be deleted.

item
    Menu item to be deleted.

See also

wxMenu::FindItem (p. 692), *wxMenu::Destroy* (p. 691), *wxMenu::Remove* (p. 695)

wxMenu::Destroy

void Destroy(**int** *id*)

void Destroy(**wxMenuItem** *item)

Deletes the menu item from the menu. If the item is a submenu, it will be deleted. Use *Remove* (p. 695) if you want to keep the submenu (for example, to reuse it later).

Parameters

id
    Id of the menu item to be deleted.

item
    Menu item to be deleted.

See also

wxMenu::FindItem (p. 692), *wxMenu::Deletes* (p. 691), *wxMenu::Remove* (p. 695)

wxMenu::Enable

void Enable(**int** *id*, **const bool** *enable*)

Enables or disables (greys out) a menu item.

Parameters

id
 The menu item identifier.

enable
 TRUE to enable the menu item, FALSE to disable it.

See also

wxMenu::IsEnabled (p. 695)

wxMenu::FindItem

int FindItem(**const wxString&** *itemString*) **const**

Finds the menu item id for a menu item string.

wxMenuItem * FindItem(**int** *id*, **wxMenu *****menu* = *NULL*) **const**

Finds the menu item object associated with the given menu item identifier and, optionally, the (sub)menu it belongs to.

Parameters

itemString
 Menu item string to find.

id
 Menu item identifier.

menu
 If the pointer is not NULL, it will be filled with the items parent menu (if the item was found)

Return value

First form: menu item identifier, or wxNOT_FOUND if none is found.

Second form: returns the menu item object, or NULL if it is not found.

Remarks

Any special menu codes are stripped out of source and target strings before matching.

wxPython note: The name of this method in wxPython is `FindItemById` and it does not support the second parameter.

wxMenu::GetHelpString

wxString GetHelpString(**int** *id*) **const**

Returns the help string associated with a menu item.

Parameters

id
> The menu item identifier.

Return value

The help string, or the empty string if there is no help string or the item was not found.

See also

wxMenu::SetHelpString (p. 696), *wxMenu::Append* (p. 689)

wxMenu::GetLabel

wxString GetLabel(**int** *id*) **const**

Returns a menu item label.

Parameters

id
> The menu item identifier.

Return value

The item label, or the empty string if the item was not found.

See also

wxMenu::SetLabel (p. 696)

wxMenu::GetMenuItemCount

size_t GetMenuItemCount() **const**

Returns the number of items in the menu.

wxMenu::GetMenuItems

wxMenuItemList& GetMenuItems() **const**

Returns the list of items in the menu. wxMenuItemList is a pseudo-template list class containing wxMenuItem pointers.

wxMenu::GetTitle

wxString GetTitle() **const**

Returns the title of the menu.

Remarks

This is relevant only to popup menus.

See also

wxMenu::SetTitle (p. 696)

wxMenu::Insert

bool Insert(**size_t** *pos*, **wxMenuItem** **item*)

Inserts the given *item* before the position *pos*. Inserting the item at the position *GetMenuItemCount* (p. 693) is the same as appending it.

See also

wxMenu::Append (p. 689)

wxMenu::IsChecked

bool IsChecked(**int** *id*) **const**

Determines whether a menu item is checked.

Parameters

id
    The menu item identifier.

Return value

TRUE if the menu item is checked, FALSE otherwise.

See also

wxMenu::Check (p. 690)

wxMenu::IsEnabled

bool IsEnabled(**int** *id*) **const**

Determines whether a menu item is enabled.

Parameters

id
    The menu item identifier.

Return value

TRUE if the menu item is enabled, FALSE otherwise.

See also

wxMenu::Enable (p. 692)

wxMenu::Remove

wxMenuItem * Remove(**int** *id*)

wxMenuItem * Remove(**wxMenuItem ***item*)

Removes the menu item from the menu but doesn't delete the associated C++ object. This allows to reuse the same item later by adding it back to the menu (especially useful with submenus).

Parameters

id
    The identifier of the menu item to remove.

item
    The menu item to remove.

Return value

The item which was detached from the menu.

wxMenu::SetHelpString

void SetHelpString(**int** *id*, **const wxString&** *helpString*)

Sets an item's help string.

Parameters

id
    The menu item identifier.

helpString
    The help string to set.

See also

wxMenu::GetHelpString (p. 693)

wxMenu::SetLabel

void SetLabel(**int** *id*, **const wxString&** *label*)

Sets the label of a menu item.

Parameters

id
    The menu item identifier.

label
    The menu item label to set.

See also

wxMenu::Append (p. 689), *wxMenu::GetLabel* (p. 693)

wxMenu::SetTitle

void SetTitle(**const wxString&** *title*)

Sets the title of the menu.

Parameters

title
    The title to set.

Remarks

This is relevant only to popup menus.

See also

wxMenu::SetTitle (p. 696)

wxMenu::UpdateUI

void UpdateUI(**wxEvtHandler*** *source = NULL*) **const**

Sends events to *source* (or owning window if NULL) to update the menu UI. This is called just before the menu is popped up with *wxWindow::PopupMenu* (p. 1223), but the application may call it at other times if required.

See also

wxUpdateUIEvent (p. 1166)

wxMenuBar

A menu bar is a series of menus accessible from the top of a frame.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/menu.h>

Event handling

To respond to a menu selection, provide a handler for EVT_MENU, in the frame that contains the menu bar. If you have a toolbar which uses the same identifiers as your EVT_MENU entries, events from the toolbar will also be processed by your EVT_MENU event handlers.

Note that menu commands (and UI update events for menus) are first sent to the focus window within the frame. If no window within the frame has the focus, then the events are sent directly to the frame. This allows command and UI update handling to be processed by specific windows and controls, and not necessarily by the application frame.

See also

wxMenu (p. 687), *Event handling overview* (p. 1372)

wxMenuBar::wxMenuBar

void wxMenuBar(**long** *style = 0*)

Default constructor.

void wxMenuBar(**int** *n*, **wxMenu*** *menus[]*, **const wxString** *titles[]*)

Construct a menu bar from arrays of menus and titles.

Parameters

n
> The number of menus.

menus
> An array of menus. Do not use this array again - it now belongs to the menu bar.

titles
> An array of title strings. Deallocate this array after creating the menu bar.

style
> If `wxMB_DOCKABLE` the menu bar can be detached (wxGTK only).

wxPython note: Only the default constructor is supported in wxPython. Use wxMenuBar.Append instead.

wxMenuBar::~wxMenuBar

void ~wxMenuBar()

Destructor, destroying the menu bar and removing it from the parent frame (if any).

wxMenuBar::Append

bool Append(**wxMenu** **menu*, **const wxString&** *title*)

Adds the item to the end of the menu bar.

Parameters

menu
> The menu to add. Do not deallocate this menu after calling **Append**.

title
> The title of the menu.

Return value

TRUE on success, FALSE if an error occurred.

See also

wxMenuBar::Insert (p. 703)

wxMenuBar::Check

void Check(**int** *id*, **const bool** *check*)

Checks or unchecks a menu item.

Parameters

id
> The menu item identifier.

check
> If TRUE, checks the menu item, otherwise the item is unchecked.

Remarks

Only use this when the menu bar has been associated with a frame; otherwise, use the wxMenu equivalent call.

wxMenuBar::Enable

void Enable(**int** *id*, **const bool** *enable*)

Enables or disables (greys out) a menu item.

Parameters

id
> The menu item identifier.

enable
> TRUE to enable the item, FALSE to disable it.

Remarks

Only use this when the menu bar has been associated with a frame; otherwise, use the wxMenu equivalent call.

wxMenuBar::EnableTop

void EnableTop(**int** *pos*, **const bool** *enable*)

Enables or disables a whole menu.

Parameters

pos
    The position of the menu, starting from zero.

enable
    TRUE to enable the menu, FALSE to disable it.

Remarks

Only use this when the menu bar has been associated with a frame.

wxMenuBar::FindMenu

int FindMenu(**const wxString&** *title*) **const**

Returns the index of the menu with the given *title* or wxNOT_FOUND if no such menu exists in this menubar. The *title* parameter may specify either the menu title (with accelerator characters, i.e. "`&File`") or just the menu label ("`File`") indifferently.

wxMenuBar::FindMenuItem

int FindMenuItem(**const wxString&** *menuString*, **const wxString&** *itemString*) **const**

Finds the menu item id for a menu name/menu item string pair.

Parameters

menuString
    Menu title to find.

itemString
    Item to find.

Return value

The menu item identifier, or wxNOT_FOUND if none was found.

Remarks

Any special menu codes are stripped out of source and target strings before matching.

wxMenuBar::FindItem

wxMenuItem * FindItem(**int** *id*, **wxMenu** ***menu = NULL*) **const**

Finds the menu item object associated with the given menu item identifier.

Parameters

id
Menu item identifier.

menu
If not NULL, menu will get set to the associated menu.

Return value

The found menu item object, or NULL if one was not found.

wxMenuBar::GetHelpString

wxString GetHelpString(**int** *id*) **const**

Gets the help string associated with the menu item identifer.

Parameters

id
The menu item identifier.

Return value

The help string, or the empty string if there was no help string or the menu item was not found.

See also

wxMenuBar::SetHelpString (p. 705)

wxMenuBar::GetLabel

wxString GetLabel(**int** *id*) **const**

Gets the label associated with a menu item.

Parameters

id
    The menu item identifier.

Return value

The menu item label, or the empty string if the item was not found.

Remarks

Use only after the menubar has been associated with a frame.

wxMenuBar::GetLabelTop

wxString GetLabelTop(**int** *pos*) **const**

Returns the label of a top-level menu.

Parameters

pos
    Position of the menu on the menu bar, starting from zero.

Return value

The menu label, or the empty string if the menu was not found.

Remarks

Use only after the menubar has been associated with a frame.

See also

wxMenuBar::SetLabelTop (p. 706)

wxMenuBar::GetMenu

wxMenu* GetMenu(**int** *menuIndex*) **const**

Returns the menu at *menuIndex* (zero-based).

wxMenuBar::GetMenuCount

int GetMenuCount() **const**

Returns the number of menus in this menubar.

wxMenuBar::Insert

bool Insert(**size_t** *pos*, **wxMenu** *menu, **const wxString&** *title*)

Inserts the menu at the given position into the menu bar. Inserting menu at position 0 will insert it in the very beginning of it, inserting at position *GetMenuCount()* (p. 702) is the same as calling *Append()* (p. 698).

Parameters

pos
    The position of the new menu in the menu bar

menu
    The menu to add. wxMenuBar owns the menu and will free it.

title
    The title of the menu.

Return value

TRUE on success, FALSE if an error occurred.

See also

wxMenuBar::Append (p. 698)

wxMenuBar::IsChecked

bool IsChecked(**int** *id*) **const**

Determines whether an item is checked.

Parameters

id
    The menu item identifier.

Return value

TRUE if the item was found and is checked, FALSE otherwise.

wxMenuBar::IsEnabled

bool IsEnabled(int *id*) const

Determines whether an item is enabled.

Parameters

id
   The menu item identifier.

Return value

TRUE if the item was found and is enabled, FALSE otherwise.

wxMenuBar::Refresh

void Refresh()

Redraw the menu bar

wxMenuBar::Remove

wxMenu * Remove(size_t *pos*)

Removes the menu from the menu bar and returns the menu object - the caller is reposnbile for deleting it. This function may be used together with *wxMenuBar::Insert* (p. 703) to change the menubar dynamically.

See also

wxMenuBar::Replace (p. 704)

wxMenuBar::Replace

wxMenu * Replace(size_t *pos*, wxMenu **menu*, const wxString& *title*)

Replaces the menu at the given position with another one.

Parameters

pos
   The position of the new menu in the menu bar

menu
   The menu to add.

title
   The title of the menu.

Return value

The menu which was previously at the position *pos*. The caller is responsible for deleting it.

See also

wxMenuBar::Insert (p. 703), *wxMenuBar::Remove* (p. 704)

wxMenuBar::SetHelpString

void SetHelpString(**int** *id*, **const wxString&** *helpString*)

Sets the help string associated with a menu item.

Parameters

id
    Menu item identifier.

helpString
    Help string to associate with the menu item.

See also

wxMenuBar::GetHelpString (p. 701)

wxMenuBar::SetLabel

void SetLabel(**int** *id*, **const wxString&** *label*)

Sets the label of a menu item.

Parameters

id
    Menu item identifier.

label
    Menu item label.

Remarks

Use only after the menubar has been associated with a frame.

See also

wxMenuBar::SetLabelTop

void SetLabelTop(**int** *pos*, **const wxString&** *label*)

Sets the label of a top-level menu.

Parameters

pos
   The position of a menu on the menu bar, starting from zero.

label
   The menu label.

Remarks

Use only after the menubar has been associated with a frame.

See also

wxMenuItem

A menu item represents an item in a popup menu. Note that the majority of this class is only implemented under Windows so far, but everything except fonts, colours and bitmaps can be achieved via wxMenu on all platforms.

Derived from

wxOwnerDrawn (Windows only)
wxObject (p. 750)

Include files

<wx/menuitem.h>

See also

wxMenuItem::wxMenuItem

 wxMenuItem(**wxMenu*** *parentMenu = NULL*, **int** *id = ID_SEPARATOR*, **const wxString&** *text = ""*, **const wxString&** *helpString = ""*, **bool** *checkable = FALSE*, **wxMenu*** *subMenu = NULL*,)

Constructs a wxMenuItem object.

Parameters

parentMenu
      Menu that the menu item belongs to.

id
      Identifier for this menu item, or ID_SEPARATOR to indicate a separator.

text
      Text for the menu item, as shown on the menu.

helpString
      Optional help string that will be shown on the status bar.

checkable
      TRUE if this menu item is checkable.

subMenu
      If non-NULL, indicates that the menu item is a submenu.

wxMenuItem::~wxMenuItem

 ~wxMenuItem()

Destructor.

wxMenuItem::Check

void Check(**bool** *check*)

Checks or unchecks the menu item.

wxMenuItem::DeleteSubMenu

void DeleteSubMenu()

Deletes the submenu, if any.

wxMenuItem::Enable

void Enable(**bool** *enable*)

Enables or disables the menu item.

wxMenuItem::GetBackgroundColour

wxColour& GetBackgroundColour() **const**

Returns the background colour associated with the menu item (Windows only).

wxMenuItem::GetBitmap

wxBitmap& GetBitmap(**bool** *checked = TRUE*) **const**

Returns the checked or unchecked bitmap (Windows only).

wxMenuItem::GetFont

wxFont& GetFont() **const**

Returns the font associated with the menu item (Windows only).

wxMenuItem::GetHelp

wxString GetHelp() **const**

Returns the help string associated with the menu item.

wxMenuItem::GetId

int GetId() **const**

Returns the menu item identifier.

wxMenuItem::GetLabel

wxString GetLabel() **const**

Returns the text associated with the menu item without any accelerator characaters it might contain.

See also

GetText (p. 709), *GetLabelFromText* (p. 709)

wxMenuItem::GetLabelFromText

static wxString GetLabelFromText(const wxString& *text*)

Strips all accelerator characeters and mnemonics from the given *text*. For example,

```
wxMenuItem::GetLabelFromText("&Hello\tCtrl-H");
```

will return just `"Hello"`.

See also

GetText (p. 709), *GetLabel* (p. 708)

wxMenuItem::GetMarginWidth

int GetMarginWidth() const

Gets the width of the menu item checkmark bitmap (Windows only).

wxMenuItem::GetName

wxString GetName() const

Returns the text associated with the menu item.

NB: this function is deprecated, please use *GetText* (p. 709) or *GetLabel* (p. 708) instead.

wxMenuItem::GetText

wxString GetText() const

Returns the text associated with the menu item, such as it was passed to the wxMenuItem constructor, i.e. with any accelerator characters it may contain.

See also

GetLabel (p. 708), *GetLabelFromText* (p. 709)

wxMenuItem::GetSubMenu

wxMenu* GetSubMenu() **const**

Returns the submenu associated with the menu item, or NULL if there isn't one.

wxMenuItem::GetTextColour

wxColour& GetTextColour() **const**

Returns the text colour associated with the menu item (Windows only).

wxMenuItem::IsCheckable

bool IsCheckable() **const**

Returns TRUE if the item is checkable.

wxMenuItem::IsChecked

bool IsChecked() **const**

Returns TRUE if the item is checked.

wxMenuItem::IsEnabled

bool IsEnabled() **const**

Returns TRUE if the item is enabled.

wxMenuItem::IsSeparator

bool IsSeparator() **const**

Returns TRUE if the item is a separator.

wxMenuItem::SetBackgroundColour

void SetBackgroundColour(**const wxColour&** *colour*) **const**

Sets the background colour associated with the menu item (Windows only).

wxMenuItem::SetBitmaps

void SetBitmaps(**const wxBitmap&** *checked*, **const wxBitmap&** *unchecked =*
wxNullBitmap) **const**

Sets the checked/unchecked bitmaps for the menu item (Windows only). The first bitmap
is also used as the single bitmap for uncheckable menu items.

wxMenuItem::SetFont

void SetFont(**const wxFont&** *font*) **const**

Sets the font associated with the menu item (Windows only).

wxMenuItem::SetHelp

void SetHelp(**const wxString&** *helpString*) **const**

Sets the help string.

wxMenuItem::SetMarginWidth

void SetMarginWidth(**int** *width*) **const**

Sets the width of the menu item checkmark bitmap (Windows only).

wxMenuItem::SetName

void SetName(**const wxString&** *text*) **const**

Sets the text associated with the menu item.

wxMenuItem::SetTextColour

void SetTextColour(**const wxColour&** *colour*) **const**

Sets the text colour associated with the menu item (Windows only).

wxMenuEvent

This class is used for a variety of menu-related events. Note that these do not include
menu command events.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a menu event, use these event handler macros to direct input to member functions that take a wxMenuEvent argument.

EVT_MENU_CHAR(func)	Process a wxEVT_MENU_CHAR event (a keypress when a menu is showing). Windows only; not yet implemented.
EVT_MENU_INIT(func)	Process a wxEVT_MENU_INIT event (the menu is about to pop up). Windows only; not yet implemented.
EVT_MENU_HIGHLIGHT(func)	Process a wxEVT_MENU_HIGHLIGHT event (a menu item is being highlighted). Windows only; not yet implemented.
EVT_POPUP_MENU(func)	Process a wxEVT_POPUP_MENU event (a menu item is being highlighted). Windows only; not yet implemented.
EVT_CONTEXT_MENU(func)	Process a wxEVT_CONTEXT_MENU event (F1 has been pressed with a particular menu item highlighted). Windows only; not yet implemented.

See also

wxWindow::OnMenuHighlight (p. 1218), *Event handling overview* (p. 1372)

wxMenuEvent::wxMenuEvent

wxMenuEvent(**WXTYPE** *id = 0*, **int** *id = 0*, **wxDC*** *dc = NULL*)

Constructor.

wxMenuEvent::m_menuId

int m_menuId

The relevant menu identifier.

wxMenuEvent::GetMenuId

int GetMenuId() **const**

Returns the menu identifier associated with the event.

wxMessageDialog

This class represents a dialog that shows a single or multi-line message, with a choice of OK, Yes, No and Cancel buttons.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/msgdlg.h>

See also

wxMessageDialog overview (p. 1410)

wxMessageDialog::wxMessageDialog

 wxMessageDialog(**wxWindow*** *parent*, **const wxString&** *message*, **const wxString&** *caption = "Message box"*, **long** *style = wxOK | wxCANCEL | wxCENTRE*, **const wxPoint&** *pos = wxDefaultPosition*)

Constructor. Use *wxMessageDialog::ShowModal* (p. 714) to show the dialog.

Parameters

parent
    Parent window.

message

Message to show on the dialog.

caption

The dialog caption.

style

A dialog style (bitlist) containing flags chosen from the following:

wxOK	Show an OK button.
wxCANCEL	Show a Cancel button.
wxYES_NO	Show Yes and No buttons.
wxYES_DEFAULT	Used with **wxYES_NO**, makes **Yes** button the default - which is the default behaviour.
wxNO_DEFAULT	Used with **wxYES_NO**, makes **No** button the default.
wxCENTRE	Centre the message. Not Windows.
wxICON_EXCLAMATION	Shows an exclamation mark icon.
wxICON_HAND	Shows an error icon.
wxICON_ERROR	Shows an error icon - the same as wxICON_HAND.
wxICON_QUESTION	Shows a question mark icon.
wxICON_INFORMATION	Shows an information (i) icon.

pos

Dialog position. Not Windows.

wxMessageDialog::~wxMessageDialog

 ~wxMessageDialog()

Destructor.

wxMessageDialog::ShowModal

int ShowModal()

Shows the dialog, returning one of wxID_OK, wxID_CANCEL, wxID_YES, wxID_NO.

wxMetafile

A **wxMetafile** represents the MS Windows metafile object, so metafile operations have no effect in X. In wxWindows, only sufficient functionality has been provided for copying a graphic to the clipboard; this may be extended in a future version. Presently, the only way of creating a metafile is to use a wxMetafileDC.

Derived from

wxObject (p. 750)

Include files

<wx/metafile.h>

See also

wxMetafileDC (p. 716)

wxMetafile::wxMetafile

wxMetafile (**const wxString&** *filename = ""*)

Constructor. If a filename is given, the Windows disk metafile is read in. Check whether this was performed successfully by using the *wxMetafile::Ok* (p. 715) member.

wxMetafile::~wxMetafile

~wxMetafile ()

Destructor.

wxMetafile::Ok

bool Ok()

Returns TRUE if the metafile is valid.

wxMetafile::Play

bool Play(**wxDC** **dc*)

Plays the metafile into the given device context, returning TRUE if successful.

wxMetafile::SetClipboard

bool SetClipboard(**int** *width = 0*, **int** *height = 0*)

Passes the metafile data to the clipboard. The metafile can no longer be used for anything, but the wxMetafile object must still be destroyed by the application.

Below is a example of metafle, metafile device context and clipboard use from the `hello.cpp` example. Note the way the metafile dimensions are passed to the clipboard, making use of the device context's ability to keep track of the maximum extent of drawing commands.

```
  wxMetafileDC dc;
  if (dc.Ok())
  {
    Draw(dc, FALSE);
    wxMetafile *mf = dc.Close();
    if (mf)
    {
      bool success = mf->SetClipboard((int)(dc.MaxX() + 10),
(int)(dc.MaxY() + 10));
      delete mf;
    }
  }
```

wxMetafileDC

This is a type of device context that allows a metafile object to be created (Windows only), and has most of the characteristics of a normal **wxDC**. The *wxMetafileDC::Close* (p. 717) member must be called after drawing into the device context, to return a metafile. The only purpose for this at present is to allow the metafile to be copied to the clipboard (see *wxMetafile* (p. 714)).

Adding metafile capability to an application should be easy if you already write to a wxDC; simply pass the wxMetafileDC to your drawing function instead. You may wish to conditionally compile this code so it is not compiled under X (although no harm will result if you leave it in).

Note that a metafile saved to disk is in standard Windows metafile format, and cannot be imported into most applications. To make it importable, call the function *::wxMakeMetafilePlaceable* (p. 1269) after closing your disk-based metafile device context.

Derived from

wxDC (p. 282)
wxObject (p. 750)

Include files

<wx/metafile.h>

See also

wxMetafile (p. 714), *wxDC* (p. 282)

wxMetafileDC::wxMetafileDC

wxMetafileDC(**const wxString&** *filename = ""*)

Constructor. If no filename is passed, the metafile is created in memory.

wxMetafileDC::~wxMetafileDC

~wxMetafileDC()

Destructor.

wxMetafileDC::Close

wxMetafile * Close()

This must be called after the device context is finished with. A metafile is returned, and ownership of it passes to the calling application (so it should be destroyed explicitly).

wxMimeTypesManager

This class allows the application to retrieve the information about all known MIME types from a system-specific location and the filename extensions to the MIME types and vice versa. After initialization the functions *wxMimeTypesManager::GetFileTypeFromMimeType* (p. 720) and *wxMimeTypesManager::GetFileTypeFromExtension* (p. 719) may be called: they will return a *wxFileType* (p. 430) object which may be further queried for file description, icon and other attributes.

Windows: MIME type information is stored in the registry and no additional initialization is needed.

Unix: MIME type information is stored in the files mailcap and mime.types (system-wide) and .mailcap and .mime.types in the current user's home directory: all of these files are searched for and loaded if found by default. However, additional functions *wxMimeTypesManager::ReadMailcap* (p. 720) and *wxMimeTypesManager::ReadMimeTypes* (p. 720) are provided to load additional files.

If GNOME or KDE desktop environment is installed, then wxMimeTypesManager gathers MIME information from respective files (e.g. .kdelnk files under KDE).

NB: Currently, wxMimeTypesManager is limited to reading MIME type information but it will support modifying it as well in the future versions.

Global objects

Global instance of wxMimeTypesManager is always available. It is defined as follows:

```
wxMimeTypesManager *wxTheMimeTypesManager;
```

It is recommended to use this instance instead of creating your own because gathering MIME information may take quite a long on Unix systems.

Derived from

No base class.

Include files

<wx/mimetype.h>

See also

wxFileType (p. 430)

Helper functions

All of these functions are static (i.e. don't need a wxMimeTypesManager object to call them) and provide some useful operations for string representations of MIME types. Their usage is recommended instead of directly working with MIME types using wxString functions.

IsOfType (p. 720)

Constructor and destructor

NB: You won't normally need to use more than one wxMimeTypesManager object in a program.

wxMimeTypesManager (p. 719)
~wxMimeTypesManager (p. 719)

Query database

These functions are the heart of this class: they allow to find a *file type* (p. 430) object from either file extension or MIME type. If the function is successful, it returns a pointer

to the wxFileType object which **must** be deleted by the caller, otherwise NULL will be returned.

GetFileTypeFromMimeType (p. 720)
GetFileTypeFromExtension (p. 719)

Initialization functions

Unix: These functions may be used to load additional files (except for the default ones which are loaded automatically) containing MIME information in either mailcap(5) or mime.types(5) format.

ReadMailcap (p. 720)
ReadMimeTypes (p. 720)
AddFallbacks (p. 719)

wxMimeTypesManager::wxMimeTypesManager

 wxMimeTypesManager()

Constructor puts the object in the "working" state, no additional initialization are needed - but *ReadXXX* (p. 719) may be used to load additional mailcap/mime.types files.

wxMimeTypesManager::~wxMimeTypesManager

 ~wxMimeTypesManager()

Destructor is not virtual, so this class should not be derived from.

wxMimeTypesManager::AddFallbacks

void AddFallbacks(**const wxFileTypeInfo** *fallbacks)

This function may be used to provdie hard-wired fallbacks for the MIME types and extensions that might not be present in the system MIME database.

Please see the typetest sample for an example of using it.

wxMimeTypesManager::GetFileTypeFromExtension

wxFileType* GetFileTypeFromExtension(**const wxString&** *extension*)

Gather information about the files with given extension and return the corresponding

wxFileType (p. 430) object or NULL if the extension is unknown.

wxMimeTypesManager::GetFileTypeFromMimeType

wxFileType* GetFileTypeFromMimeType(**const wxString&** *mimeType*)

Gather information about the files with given MIME type and return the corresponding *wxFileType* (p. 430) object or NULL if the MIME type is unknown.

wxMimeTypesManager::IsOfType

bool IsOfType(**const wxString&** *mimeType*, **const wxString&** *wildcard*)

This function returns TRUE if either the given *mimeType* is exactly the same as *wildcard* or if it has the same category and the subtype of *wildcard* is '*'. Note that the '*' wildcard is not allowed in *mimeType* itself.

The comparaison don by this function is case insensitive so it is not necessary to convert the strings to the same case before calling it.

wxMimeTypesManager::ReadMailcap

bool ReadMailcap(**const wxString&** *filename*, **bool** *fallback = FALSE*)

Load additional file containing information about MIME types and associated information in mailcap format. See metamail(1) and mailcap(5) for more information.

fallback parameter may be used to load additional mailcap files without overriding the settings found in the standard files: normally, entries from files loaded with ReadMailcap will override the entries from files loaded previously (and the standard ones are loaded in the very beginning), but this will not happen if this parameter is set to TRUE (default is FALSE).

The return value is TRUE if there were no errors in the file or FALSE otherwise.

wxMimeTypesManager::ReadMimeTypes

bool ReadMimeTypes(**const wxString&** *filename*)

Load additional file containing information about MIME types and associated information in mime.types file format. See metamail(1) and mailcap(5) for more information.

The return value is TRUE if there were no errors in the file or FALSE otherwise.

wxMiniFrame

A miniframe is a frame with a small title bar. It is suitable for floating toolbars that must not take up too much screen area.

Derived from

wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/minifram.h>

Window styles

wxICONIZE	Display the frame iconized (minimized) (Windows only).
wxCAPTION	Puts a caption on the frame.
wxDEFAULT_FRAME_STYLE	Defined as **wxMINIMIZE_BOX | wxMAXIMIZE_BOX | wxTHICK_FRAME | wxSYSTEM_MENU | wxCAPTION**.
wxMINIMIZE	Identical to **wxICONIZE**.
wxMINIMIZE_BOX	Displays a minimize box on the frame (Windows and Motif only).
wxMAXIMIZE	Displays the frame maximized (Windows only).
wxMAXIMIZE_BOX	Displays a maximize box on the frame (Windows and Motif only).
wxSTAY_ON_TOP	Stay on top of other windows (Windows only).
wxSYSTEM_MENU	Displays a system menu (Windows and Motif only).
wxTHICK_FRAME	Displays a thick frame around the window (Windows and Motif only).
wxTINY_CAPTION_HORIZ	Displays a small horizontal caption. Use instead of wxCAPTION.
wxTINY_CAPTION_VERT	Under Windows, displays a small vertical caption. Use instead of wxCAPTION.
wxRESIZE_BORDER	Displays a resizeable border around the window (Motif only; for Windows, it is implicit in **wxTHICK_FRAME**).

See also *window styles overview* (p. 1379). Note that all the window styles above are ignored under GTK and the mini frame cannot be resized by the user.

Remarks

This class has miniframe functionality under Windows and GTK, i.e. the presence of mini frame will not be noted in the task bar and focus behaviour is different. On other platforms, it behaves like a normal frame.

wxMDIParentFrame (p. 675), *wxMDIChildFrame* (p. 670), *wxFrame* (p. 454), *wxDialog* (p. 312)

wxMiniFrame::wxMiniFrame

wxMiniFrame ()

Default constructor.

wxMiniFrame (**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxDEFAULT_FRAME_STYLE*, **const wxString&** *name = "frame"*)

Constructor, creating the window.

Parameters

parent
> The window parent. This may be NULL. If it is non-NULL, the frame will always be displayed on top of the parent window on Windows.

id
> The window identifier. It may take a value of -1 to indicate a default value.

title
> The caption to be displayed on the frame's title bar.

pos
> The window position. A value of (-1, -1) indicates a default position, chosen by either the windowing system or wxWindows, depending on platform.

size
> The window size. A value of (-1, -1) indicates a default size, chosen by either the windowing system or wxWindows, depending on platform.

style
> The window style. See *wxMiniFrame* (p. 721).

name
> The name of the window. This parameter is used to associate a name with the item, allowing the application user to set Motif resource values for individual windows.

Remarks

The frame behaves like a normal frame on non-Windows platforms.

See also

wxMiniFrame::Create (p. 723)

wxMiniFrame::~wxMiniFrame

void ~wxMiniFrame()

Destructor. Destroys all child windows and menu bar if present.

wxMiniFrame::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE*, **const wxString&** *name* = *"frame"*)

Used in two-step frame construction. See *wxMiniFrame::wxMiniFrame* (p. 722) for further details.

wxModule

The module system is a very simple mechanism to allow applications (and parts of wxWindows itself) to define initialization and cleanup functions that are automatically called on wxWindows startup and exit.

To define a new kind of module, derive a class from wxModule, override the OnInit and OnExit functions, and add the DECLARE_DYNAMIC_CLASS and IMPLEMENT_DYNAMIC_CLASS to header and implementation files (which can be the same file). On initialization, wxWindows will find all classes derived from wxModule, create an instance of each, and call each OnInit function. On exit, wxWindows will call the OnExit function for each module instance.

Note that your module class does not have to be in a header file.

For example:

```
// A module to allow DDE initialization/cleanup
// without calling these functions from app.cpp or from
// the user's application.

class wxDDEModule: public wxModule
{
DECLARE_DYNAMIC_CLASS(wxDDEModule)
public:
```

```
    wxDDEModule() {}
    bool OnInit() { wxDDEInitialize(); return TRUE; };
    void OnExit() { wxDDECleanUp(); };
};

IMPLEMENT_DYNAMIC_CLASS(wxDDEModule, wxModule)
```

Derived from

wxObject (p. 750)

Include files

<wx/module.h>

wxModule::wxModule

wxModule()

Constructs a wxModule object.

wxModule::~wxModule

~wxModule()

Destructor.

wxModule::CleanupModules

static void CleanupModules()

Calls Exit for each module instance. Called by wxWindows on exit, so there is no need for an application to call it.

wxModule::Exit

void Exit()

Calls OnExit. This function is called by wxWindows and should not need to be called by an application.

wxModule::Init

bool Init()

Calls OnInit. This function is called by wxWindows and should not need to be called by an application.

wxModule::InitializeModules

static bool InitializeModules()

Calls Init for each module instance. Called by wxWindows on startup, so there is no need for an application to call it.

wxModule::OnExit

virtual void OnExit()

Provide this function with appropriate cleanup for your module.

wxModule::OnInit

virtual bool OnInit()

Provide this function with appropriate initialization for your module. If the function returns FALSE, wxWindows will exit immediately.

wxModule::RegisterModule

static void RegisterModule(**wxModule*** *module*)

Registers this module with wxWindows. Called by wxWindows on startup, so there is no need for an application to call it.

wxModule::RegisterModules

static bool RegisterModules()

Creates instances of and registers all modules. Called by wxWindows on startup, so there is no need for an application to call it.

wxMouseEvent

This event class contains information about mouse events. See
wxWindow::OnMouseEvent (p. 1219).

NB: Note that under Windows mouse enter and leave events are not natively supported
by the system but are generated by wxWindows itself. This has several drawbacks: the
LEAVE_WINDOW event might be received some time after the mouse left the window
and the state variables for it may have changed during this time.

NB: Note the difference between methods like *LeftDown* (p. 731) and *LeftIsDown* (p.
731): the formet returns TRUEwhen the event corresponds to the left mouse button click
while the latter returns TRUE if the left mouse button is currently being pressed. For
example, when the user is dragging the mouse you can use *LeftIsDown* (p. 731) to test
whether the left mouse button is (still) depressed. Also, by convention, if*LeftDown* (p.
731) returns TRUE, *LeftIsDown* (p. 731) will also return TRUE in wxWindows whatever
the underlying GUI behaviour is (which is platform-dependent). The same applies, of
course, to other mouse buttons as well.

Derived from

wxEvent (p. 377)

Include files

<wx/event.h>

Event table macros

To process a mouse event, use these event handler macros to direct input to member
functions that take a wxMouseEvent argument.

EVT_LEFT_DOWN(func)	Process a wxEVT_LEFT_DOWN event.
EVT_LEFT_UP(func)	Process a wxEVT_LEFT_UP event.
EVT_LEFT_DCLICK(func)	Process a wxEVT_LEFT_DCLICK event.
EVT_MIDDLE_DOWN(func)	Process a wxEVT_MIDDLE_DOWN event.
EVT_MIDDLE_UP(func)	Process a wxEVT_MIDDLE_UP event.
EVT_MIDDLE_DCLICK(func)	Process a wxEVT_MIDDLE_DCLICK event.
EVT_RIGHT_DOWN(func)	Process a wxEVT_RIGHT_DOWN event.
EVT_RIGHT_UP(func)	Process a wxEVT_RIGHT_UP event.
EVT_RIGHT_DCLICK(func)	Process a wxEVT_RIGHT_DCLICK event.
EVT_MOTION(func)	Process a wxEVT_MOTION event.
EVT_ENTER_WINDOW(func)	Process a wxEVT_ENTER_WINDOW event.
EVT_LEAVE_WINDOW(func)	Process a wxEVT_LEAVE_WINDOW event.
EVT_MOUSE_EVENTS(func)	Process all mouse events.

wxMouseEvent::m_altDown

bool m_altDown

TRUE if the Alt key is pressed down.

wxMouseEvent::m_controlDown

bool m_controlDown

TRUE if control key is pressed down.

wxMouseEvent::m_leftDown

bool m_leftDown

TRUE if the left mouse button is currently pressed down.

wxMouseEvent::m_middleDown

bool m_middleDown

TRUE if the middle mouse button is currently pressed down.

wxMouseEvent::m_rightDown

bool m_rightDown

TRUE if the right mouse button is currently pressed down.

wxMouseEvent::m_leftDown

bool m_leftDown

TRUE if the left mouse button is currently pressed down.

wxMouseEvent::m_metaDown

bool m_metaDown

TRUE if the Meta key is pressed down.

wxMouseEvent::m_shiftDown

bool m_shiftDown

TRUE if shift is pressed down.

wxMouseEvent::m_x

long m_x

X-coordinate of the event.

wxMouseEvent::m_y

long m_y

Y-coordinate of the event.

wxMouseEvent::wxMouseEvent

wxMouseEvent(**WXTYPE** *mouseEventType = 0*, **int** *id = 0*)

Constructor. Valid event types are:

- **wxEVT_ENTER_WINDOW**
- **wxEVT_LEAVE_WINDOW**
- **wxEVT_LEFT_DOWN**
- **wxEVT_LEFT_UP**
- **wxEVT_LEFT_DCLICK**
- **wxEVT_MIDDLE_DOWN**
- **wxEVT_MIDDLE_UP**
- **wxEVT_MIDDLE_DCLICK**
- **wxEVT_RIGHT_DOWN**
- **wxEVT_RIGHT_UP**
- **wxEVT_RIGHT_DCLICK**
- **wxEVT_MOTION**

wxMouseEvent::AltDown

bool AltDown()

Returns TRUE if the Alt key was down at the time of the event.

wxMouseEvent::Button

bool Button(**int** *button*)

Returns TRUE if the identified mouse button is changing state. Valid values of *button* are 1, 2 or 3 for left, middle and right buttons respectively.

Not all mice have middle buttons so a portable application should avoid this one.

wxMouseEvent::ButtonDClick

bool ButtonDClick(**int** *but = -1*)

If the argument is omitted, this returns TRUE if the event was a mouse double click event. Otherwise the argument specifies which double click event was generated (1, 2 or 3 for left, middle and right buttons respectively).

wxMouseEvent::ButtonDown

bool ButtonDown(**int** *but = -1*)

If the argument is omitted, this returns TRUE if the event was a mouse button down event. Otherwise the argument specifies which button-down event was generated (1, 2 or 3 for left, middle and right buttons respectively).

wxMouseEvent::ButtonUp

bool ButtonUp(**int** *but = -1*)

If the argument is omitted, this returns TRUE if the event was a mouse button up event. Otherwise the argument specifies which button-up event was generated (1, 2 or 3 for left, middle and right buttons respectively).

wxMouseEvent::ControlDown

bool ControlDown()

Returns TRUE if the control key was down at the time of the event.

wxMouseEvent::Dragging

bool Dragging()

Returns TRUE if this was a dragging event (motion while a button is depressed).

wxMouseEvent::Entering

bool Entering()

Returns TRUE if the mouse was entering the window.

See also *wxMouseEvent::Leaving* (p. 731).

wxMouseEvent::GetPosition

wxPoint GetPosition() **const**

void GetPosition(**wxCoord*** *x*, **wxCoord*** *y*) **const**

void GetPosition(**long*** *x*, **long*** *y*) **const**

Sets *x and *y to the position at which the event occurred.

Returns the physical mouse position in pixels.

wxMouseEvent::GetLogicalPosition

wxPoint GetLogicalPosition(**const wxDC&** *dc*) **const**

Returns the logical mouse position in pixels (i.e. translated according to the translation set for the DC, which usually indicates that the window has been scrolled).

wxMouseEvent::GetX

long GetX() **const**

Returns X coordinate of the physical mouse event position.

wxMouseEvent::GetY

long GetY()

Returns Y coordinate of the physical mouse event position.

wxMouseEvent::IsButton

bool IsButton() **const**

Returns TRUE if the event was a mouse button event (not necessarily a button down event - that may be tested using *ButtonDown*).

wxMouseEvent::Leaving

bool Leaving() const

Returns TRUE if the mouse was leaving the window.

See also *wxMouseEvent::Entering* (p. 729).

wxMouseEvent::LeftDClick

bool LeftDClick() const

Returns TRUE if the event was a left double click.

wxMouseEvent::LeftDown

bool LeftDown() const

Returns TRUE if the left mouse button changed to down.

wxMouseEvent::LeftIsDown

bool LeftIsDown() const

Returns TRUE if the left mouse button is currently down, independent of the current event type.

Please notice that it is **not** the same as *LeftDown* (p. 731) which returns TRUE if the left mouse button was just pressed. Rather, it describes the state of the mouse button before the event happened.

This event is usually used in the mouse event handlers which process "move mouse" messages to determine whether the user is (still) dragging the mouse.

wxMouseEvent::LeftUp

bool LeftUp() const

Returns TRUE if the left mouse button changed to up.

wxMouseEvent::MetaDown

bool MetaDown() const

Returns TRUE if the Meta key was down at the time of the event.

wxMouseEvent::MiddleDClick

bool MiddleDClick() **const**

Returns TRUE if the event was a middle double click.

wxMouseEvent::MiddleDown

bool MiddleDown() **const**

Returns TRUE if the middle mouse button changed to down.

wxMouseEvent::MiddleIsDown

bool MiddleIsDown() **const**

Returns TRUE if the middle mouse button is currently down, independent of the current event type.

wxMouseEvent::MiddleUp

bool MiddleUp() **const**

Returns TRUE if the middle mouse button changed to up.

wxMouseEvent::Moving

bool Moving() **const**

Returns TRUE if this was a motion event (no buttons depressed).

wxMouseEvent::RightDClick

bool RightDClick() **const**

Returns TRUE if the event was a right double click.

wxMouseEvent::RightDown

bool RightDown() const

Returns TRUE if the right mouse button changed to down.

wxMouseEvent::RightIsDown

bool RightIsDown() const

Returns TRUE if the right mouse button is currently down, independent of the current event type.

wxMouseEvent::RightUp

bool RightUp() const

Returns TRUE if the right mouse button changed to up.

wxMouseEvent::ShiftDown

bool ShiftDown() const

Returns TRUE if the shift key was down at the time of the event.

wxMoveEvent

A move event holds information about move change events.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a move event, use this event handler macro to direct input to a member function that takes a wxMoveEvent argument.

EVT_MOVE(func)	Process a wxEVT_MOVE event, which is generated when a window is moved.

See also

wxWindow::OnMove (p. 1219), *wxPoint* (p. 790), *Event handling overview* (p. 1372)

wxMoveEvent::wxMoveEvent

wxMoveEvent(**const wxPoint&** *pt*, **int** *id = 0*)

Constructor.

wxMoveEvent::GetPosition

wxPoint GetPosition() **const**

Returns the position of the window generating the move change event.

wxMultipleChoiceDialog

This class represents a dialog that shows a list of strings, and allows the user to select one or more.

NOTE: this class is not yet implemented.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/choicdlg.h>

See also

wxMultipleChoiceDialog overview (p. 1411)

wxMutex

A mutex object is a synchronization object whose state is set to signaled when it is not owned by any thread, and nonsignaled when it is owned. Its name comes from its usefulness in coordinating mutually-exclusive access to a shared resource. Only one thread at a time can own a mutex object.

For example, when several thread use the data stored in the linked list, modifications to the list should be only allowed to one thread at a time because during a new node addition the list integrity is temporarily broken (this is also called *program invariant*).

Example

```
    // this variable has an "s_" prefix because it is static: seeing an
"s_" in
    // a multithreaded program is in general a good sign that you
should use a
    // mutex (or a critical section)
    static wxMutex *s_mutexProtectingTheGlobalData;

    // we store some numbers in this global array which is presumably
used by
    // several threads simultaneously
    wxArrayInt s_data;

    void MyThread::AddNewNode(int num)
    {
        // ensure that no other thread accesses the list
        s_mutexProtectingTheGlobalList->Lock();

        s_data.Add(num);

        s_mutexProtectingTheGlobalList->Unlock();
    }

    // return TRUE the given number is greater than all array elements
    bool MyThread::IsGreater(int num)
    {
        // before using the list we must acquire the mutex
        wxMutexLocker lock(s_mutexProtectingTheGlobalData);

        size_t count = s_data.Count();
        for ( size_t n = 0; n < count; n++ )
        {
            if ( s_data[n] > num )
                return FALSE;
        }

        return TRUE;
    }
```

Notice how wxMutexLocker was used in the second function to ensure that the mutex is unlocked in any case: whether the function returns TRUE or FALSE (because the destructor of the local object *lock* is always called). Using this class instead of directly using wxMutex is, in general safer and is even more so if yoor program uses C++ exceptions.

Derived from

None.

Include files

<wx/thread.h>

See also

wxThread (p. 1106), *wxCondition* (p. 161), *wxMutexLocker* (p. 737), *wxCriticalSection* (p. 179)

wxMutex::wxMutex

wxMutex()

Default constructor.

wxMutex::~wxMutex

~wxMutex()

Destroys the wxMutex object.

wxMutex::IsLocked

bool IsLocked() **const**

Returns TRUE if the mutex is locked, FALSE otherwise.

wxMutex::Lock

wxMutexError Lock()

Locks the mutex object.

Return value

One of:

wxMUTEX_NO_ERROR	There was no error.
wxMUTEX_DEAD_LOCK	A deadlock situation was detected.
wxMUTEX_BUSY	The mutex is already locked by another thread.

wxMutex::TryLock

wxMutexError TryLock()

Tries to lock the mutex object. If it can't, returns immediately with an error.

Return value

One of:

wxMUTEX_NO_ERROR	There was no error.
wxMUTEX_DEAD_LOCK	A deadlock situation was detected.
wxMUTEX_BUSY	The mutex is already locked by another thread.

wxMutex::Unlock

wxMutexError Unlock()

Unlocks the mutex object.

Return value

One of:

wxMUTEX_NO_ERROR	There was no error.
wxMUTEX_DEAD_LOCK	A deadlock situation was detected.
wxMUTEX_BUSY	The mutex is already locked by another thread.
wxMUTEX_UNLOCKED	The calling thread tries to unlock an unlocked mutex.

wxMutexLocker

This is a small helper class to be used with *wxMutex* (p. 735) objects. A wxMutexLocker acquires a mutex lock in the constructor and releases (or unlocks) the mutex in the

destructor making it much more difficult to forget to release a mutex (which, in general, will promptly lead to the serious problems). See *wxMutex* (p. 735) for an example of wxMutexLocker usage.

Derived from

None.

Include files

<wx/thread.h>

See also

wxMutex (p. 735), *wxCriticalSectionLocker* (p. 180)

wxMutexLocker::wxMutexLocker

wxMutexLocker(**wxMutex** *mutex)

Constructs a wxMutexLocker object associated with mutex which must be non-NULL and locks it. Call *IsLocked* (p. 738) to check if the mutex was successfully locked.

wxMutexLocker::~wxMutexLocker

~wxMutexLocker()

Destuctor releases the mutex if it was successfully acquired in the ctor.

wxMutexLocker::IsOk

bool IsOk() **const**

Returns TRUE if mutex was acquired in the constructor, FALSE otherwise.

wxNotebookSizer

wxNotebookSizer is a specialized sizer to make sizers work in connection with using notebooks. This sizer is different from any other sizer as you must not add any children to it - instead, it queries the notebook class itself. The only thing this sizer does is to determine the size of the biggest page of the notebook and report an adjusted minimal size to a more toplevel sizer.

In order to query the size of notebook page, this page needs to have its own sizer, otherwise the wxNotebookSizer will ignore it. Notebook pages get there sizer by assiging one to them using *wxWindow::SetSizer* (p. 1236) and setting the auto-layout option to TRUE using *wxWindow::SetAutoLayout* (p. 1227). Here is one example showing how to add a notebook page that the notebook sizer is aware of:

```
wxNotebook *notebook = new wxNotebook( &dialog, -1 );
wxNotebookSizer *nbs = new wxNotebookSizer( notebook );

// Add panel as notebook page
wxPanel *panel = new wxPanel( notebook, -1 );
notebook->AddPage( panel, "My Notebook Page" );

wxBoxSizer *panelsizer = new wxBoxSizer( wxVERTICAL );

// Add controls to panel and panelsizer here...

panel->SetAutoLayout( TRUE );
panel->SetSizer( panelsizer );
```

See also *wxSizer* (p. 929), *wxNotebook* (p. 741).

Derived from

wxSizer (p. 929)
wxObject (p. 750)

wxNotebookSizer::wxNotebookSizer

 wxNotebookSizer (**wxNotebook*** *notebook*)

Constructor. It takes an associated notebook as its only parameter.

wxNotebookSizer::GetNotebook

wxNotebook* GetNotebook()

Returns the notebook associated with the sizer.

wxNodeBase

A node structure used in linked lists (see *wxList* (p. 619)) and derived classes. You should never use wxNodeBase class directly because it works with untyped (void *) data

and this is unsafe. Use wxNode-derived classes which are defined by WX_DECLARE_LIST and WX_DEFINE_LIST macros instead as described in *wxList* (p. 619) documentation (see example there). wxNode is defined for compatibility as wxNodeBase containing "wxObject *" pointer, but usage of this class is deprecated.

Derived from

None.

Include files

<wx/list.h>

See also

wxList (p. 619), *wxHashTable* (p. 495)

wxNodeBase::GetData

void * Data()

Retrieves the client data pointer associated with the node.

wxNodeBase::GetNext

wxNodeBase * Next()

Retrieves the next node (NULL if at end of list).

wxNodeBase::GetPrevious

wxNodeBase * GetPrevious()

Retrieves the previous node (NULL if at start of list).

wxNodeBase::SetData

void SetData(**void ****data*)

Sets the data associated with the node (usually the pointer will have been set when the node was created).

wxNodeBase::IndexOf

int IndexOf()

Returns the zero-based index of this node within the list. The return value will be NOT_FOUND if the node has not been added to a list yet.

wxNotebook

This class represents a notebook control, which manages multiple windows with associated tabs.

To use the class, create a wxNotebook object and call *AddPage* (p. 743) or *InsertPage* (p. 745), passing a window to be used as the page. Do not explicitly delete the window for a page that is currently managed by wxNotebook.

wxNotebookPage is a typedef for wxWindow.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/notebook.h>

Window styles

wxNB_FIXEDWIDTH	(Windows only)All tabs will have same width.
wxNB_LEFT	Place tabs on the left side.
wxNB_RIGHT	Place tabs on the right side.
wxNB_BOTTOM	Place tabs under instead of above the notebook pages.

See also *window styles overview* (p. 1379).

Event handling

To process input from a notebook control, use the following event handler macros to direct input to member functions that take a *wxNotebookEvent* (p. 747) argument.

EVT_NOTEBOOK_PAGE_CHANGED(id, func)	The page selection was changed.
EVT_NOTEBOOK_PAGE_CHANGING(id, func)	The page selection is about to be changed. This can be prevented by calling

Veto() (p. 750).

wxNotebookEvent (p. 747), *wxImageList* (p. 587), *wxTabCtrl* (p. 1058)

wxNotebook::wxNotebook

wxNotebook()

Default constructor.

wxNotebook(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size*, **long** *style = 0*, **const wxString&** *name = "notebook"*)

Constructs a notebook control.

Note that sometimes you can reduce flicker by passing the wxCLIP_CHILDREN window style.

Parameters

parent
      The parent window. Must be non-NULL.

id
      The window identifier.

pos
      The window position.

size
      The window size.

style
      The window style. See *wxNotebook* (p. 741).

name
      The name of the control (used only under Motif).

wxNotebook::~wxNotebook

~wxNotebook()

Destroys the wxNotebook object.

wxNotebook::AddPage

bool AddPage(**wxNotebookPage*** *page*, **const wxString&** *text*, **bool** *select = FALSE*, **int** *imageId = -1*)

Adds a new page.

Parameters

page
Specifies the new page.

text
Specifies the text for the new page.

select
Specifies whether the page should be selected.

imageId
Specifies the optional image index for the new page.

Return value

TRUE if successful, FALSE otherwise.

Remarks

Do not delete the page, it will be deleted by the notebook.

See also

wxNotebook::InsertPage (p. 745)

wxNotebook::AdvanceSelection

void AdvanceSelection(**bool** *forward = TRUE*)

Cycles through the tabs.

wxNotebook::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size*, **long** *style = 0*, **const wxString&** *name = "notebook"*)

Creates a notebook control. See *wxNotebook::wxNotebook* (p. 742) for a description of the parameters.

wxNotebook::DeleteAllPages

bool DeleteAllPages()

Deletes all pages.

wxNotebook::DeletePage

bool DeletePage(**int** *page*)

Deletes the specified page, and the associated window.

wxNotebook::GetImageList

wxImageList* GetImageList() **const**

Returns the associated image list.

See also

wxImageList (p. 587), *wxNotebook::SetImageList* (p. 746)

wxNotebook::GetPage

wxNotebookPage* GetPage(**int** *page*)

Returns the window at the given page position.

wxNotebook::GetPageCount

int GetPageCount() **const**

Returns the number of pages in the notebook control.

wxNotebook::GetPageImage

int GetPageImage(**int** *nPage*) **const**

Returns the image index for the given page.

wxNotebook::GetPageText

wxString GetPageText(**int** *nPage*) **const**

Returns the string for the given page.

wxNotebook::GetRowCount

int GetRowCount() **const**

Returns the number of rows in the notebook control.

wxNotebook::GetSelection

int GetSelection() **const**

Returns the currently selected page, or -1 if none was selected.

wxNotebook::InsertPage

bool InsertPage(**int** *index*, **wxNotebookPage*** *page*, **const wxString&** *text*, **bool** *select = FALSE*, **int** *imageId = -1*)

Inserts a new page at the specified position.

Parameters

index
     Specifies the position for the new page.

page
     Specifies the new page.

text
     Specifies the text for the new page.

select
     Specifies whether the page should be selected.

imageId
     Specifies the optional image index for the new page.

Return value

TRUE if successful, FALSE otherwise.

Remarks

Do not delete the page, it will be deleted by the notebook.

See also

wxNotebook::AddPage (p. 743)

wxNotebook::OnSelChange

void OnSelChange (**wxNotebookEvent&** *event*)

An event handler function, called when the page selection is changed.

See also

wxNotebookEvent (p. 747)

wxNotebook::RemovePage

bool RemovePage (**int** *page*)

Deletes the specified page, without deleting the associated window.

wxNotebook::SetImageList

void SetImageList(**wxImageList*** *imageList*)

Sets the image list for the page control.

See also

wxImageList (p. 587)

wxNotebook::SetPadding

void SetPadding(**const wxSize&** *padding*)

Sets the amount of space around each page's icon and label, in pixels.

wxNotebook::SetPageSize

void SetPageSize(**const wxSize&** *size*)

Sets the width and height of the pages.

wxNotebook::SetPageImage

bool SetPageImage(**int** *page*, **int** *image*)

Sets the image index for the given page. *image* is an index into the image list which was set with *wxNotebook::SetImageList* (p. 746).

wxNotebook::SetPageText

bool SetPageText(**int** *page*, **const wxString&** *text*)

Sets the text for the given page.

wxNotebook::SetSelection

int SetSelection(**int** *page*)

Sets the selection for the given page, returning the previous selection.

See also

wxNotebook::GetSelection (p. 745)

wxNotebookEvent

This class represents the events generated by a notebook control: currently, there are two of them. The PAGE_CHANGING event is sent before the current page is changed. It allows to the program to examine the current page (which can be retrieved with *GetOldSelection()* (p. 748)) and to veto the page change by calling *Veto()* (p. 750) if, for example, the current values in the controls of the old page are invalid.

The second event - PAGE_CHANGED - is sent after the page has been changed and the program cannot veto it any more, it just informs it about the page change.

To summarize, if the program is interested in validating the page values before allowing the user to change it, it should process the PAGE_CHANGING event, otherwise PAGE_CHANGED is probably enough. In any case, it is probably unnecessary to process both events at once.

NB: under Windows, GetSelection() will return the same value as GetOldSelection() when called from PAGE_CHANGING handler and not the page which is going to be selected if the handler doesn't call Veto().

Derived from

wxNotifyEvent (p. 749)
wxCommandEvent (p. 153)
wxEvent (p. 377)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/notebook.h>

Event table macros

To process a notebook event, use these event handler macros to direct input to member functions that take a wxNotebookEvent argument.

EVT_NOTEBOOK_PAGE_CHANGED(id, func)   The page selection was changed. Processes a wxEVT_COMMAND_NOTEBOOK_PAGE_CHANGED event.
EVT_NOTEBOOK_PAGE_CHANGING(id, func)   The page selection is about to be changed. Processes a wxEVT_COMMAND_NOTEBOOK_PAGE_CHANGING event. This event can be *vetoed* (p. 750).

See also

wxNotebook (p. 741), *wxTabCtrl* (p. 1058), *wxTabEvent* (p. 1063)

wxNotebookEvent::wxNotebookEvent

 wxNotebookEvent(**wxEventType** *eventType = wxEVT_NULL*, **int** *id = 0*, **int** *sel = -1*, **int** *oldSel = -1*)

Constructor (used internally by wxWindows only).

wxNotebookEvent::GetOldSelection

int GetOldSelection() **const**

Returns the page that was selected before the change, -1 if none was selected.

wxNotebookEvent::GetSelection

int GetSelection() **const**

Returns the currently selected page, or -1 if none was selected.

wxNotebookEvent::SetOldSelection

void SetOldSelection(**int** *page*)

Sets the id of the page selected before the change.

wxNotebookEvent::SetSelection

void SetSelection(**int** *page*)

Sets the selection member variable.

See also

wxNotebookEvent::GetSelection (p. 749)

wxNotifyEvent

This class is not used by the event handlers by itself, but is a base class for other event classes (such as *wxNotebookEvent* (p. 747)).

It (or an object of a derived class) is sent when the controls state is being changed and allows the program to *Veto()* (p. 750) this change if it wants to prevent it from happening.

In some rare cases (so far only dragging the items in the tree control) the event is disabled by default in which case *Allow()* (p. 750) may be called to allow it.

If both *Allow()* (p. 750) and *Veto()* (p. 750) are called, only the last method called counts.

Derived from

wxCommandEvent (p. 153)
wxEvent (p. 377)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

None

See also

wxNotebookEvent (p. 747)

wxNotifyEvent::wxNotifyEvent

wxNotifyEvent(**wxEventType** *eventType = wxEVT_NULL*, **int** *id = 0*)

Constructor (used internally by wxWindows only).

wxNotifyEvent::Allow

void Allow(**bool** *allow = TRUE*)

Allow the action signalled by this event to be carried.

wxNotifyEvent::IsAllowed

bool IsAllowed() **const**

Returns TRUE if the change is allowed (*Veto()* (p. 750) hasn't been called) or FALSE otherwise (if it was).

wxNotifyEvent::Veto

void Veto()

Prevents the change announced by this event from happening.

It is in general a good idea to notify the user about the reasons for vetoing the change because otherwise the applications behaviour (which just refuses to do what the user wants) might be quite surprising.

wxObject

This is the root class of all wxWindows classes. It declares a virtual destructor which ensures that destructors get called for all derived class objects where necessary.

wxObject is the hub of a dynamic object creation scheme, enabling a program to create instances of a class only knowing its string class name, and to query the class hierarchy.

The class contains optional debugging versions of **new** and **delete**, which can help trace memory allocation and deallocation problems.

wxObject can be used to implement reference counted objects, such as wxPen, wxBitmap and others.

See also

wxClassInfo (p. 119), *Debugging overview* (p. 1363), *wxObjectRefData* (p. 754)

wxObject::wxObject

wxObject()

Default constructor.

wxObject::~wxObject

wxObject()

Destructor. Performs dereferencing, for those objects that use reference counting.

wxObject::m_refData

wxObjectRefData* m_refData

Pointer to an object which is the object's reference-counted data.

See also

wxObject::Ref (p. 753), *wxObject::UnRef* (p. 753), *wxObject::SetRefData* (p. 753), *wxObject::GetRefData* (p. 752), *wxObjectRefData* (p. 754)

wxObject::Dump

void Dump(**ostream&** *stream*)

A virtual function that should be redefined by derived classes to allow dumping of

memory states.

Parameters

stream
    Stream on which to output dump information.

Remarks

Currently wxWindows does not define Dump for derived classes, but programmers may wish to use it for their own applications. Be sure to call the Dump member of the class's base class to allow all information to be dumped.

The implementation of this function just writes the class name of the object in debug build (__WXDEBUG__ defined), otherwise it does nothing.

wxObject::GetClassInfo

wxClassInfo * GetClassInfo()

This virtual function is redefined for every class that requires run-time type information, when using DECLARE_CLASS macros.

wxObject::GetRefData

wxObjectRefData* GetRefData() const

Returns the **m_refData** pointer.

See also

wxObject::Ref (p. 753), *wxObject::UnRef* (p. 753), *wxObject::m_refData* (p. 751), *wxObject::SetRefData* (p. 753), *wxObjectRefData* (p. 754)

wxObject::IsKindOf

bool IsKindOf(wxClassInfo *info)

Determines whether this class is a subclass of (or the same class as) the given class.

Parameters

info
    A pointer to a class information object, which may be obtained by using the CLASSINFO macro.

Return value

TRUE if the class represented by *info* is the same class as this one or is derived from it.

Example

```
bool tmp = obj->IsKindOf(CLASSINFO(wxFrame));
```

wxObject::Ref

void Ref(**const wxObject&** *clone*)

Makes this object refer to the data in *clone*.

Parameters

clone
    The object to 'clone'.

Remarks

First this function calls *wxObject::UnRef* (p. 753) on itself to decrement (and perhaps free) the data it is currently referring to.

It then sets its own m_refData to point to that of *clone*, and increments the reference count inside the data.

See also

wxObject::UnRef (p. 753), *wxObject::m_refData* (p. 751), *wxObject::SetRefData* (p. 753), *wxObject::GetRefData* (p. 752), *wxObjectRefData* (p. 754)

wxObject::SetRefData

void SetRefData(**wxObjectRefData*** *data*)

Sets the **m_refData** pointer.

See also

wxObject::Ref (p. 753), *wxObject::UnRef* (p. 753), *wxObject::m_refData* (p. 751), *wxObject::GetRefData* (p. 752), *wxObjectRefData* (p. 754)

wxObject::UnRef

void UnRef()

Decrements the reference count in the associated data, and if it is zero, deletes the data.

The **m_refData** member is set to NULL.

See also

wxObject::Ref (p. 753), *wxObject::m_refData* (p. 751), *wxObject::SetRefData* (p. 753), *wxObject::GetRefData* (p. 752), *wxObjectRefData* (p. 754)

wxObject::operator new

void * new(**size_t** *size*, **const wxString&** *filename = NULL*, **int** *lineNum = 0*)

The *new* operator is defined for debugging versions of the library only, when the identifier __WXDEBUG__ is defined. It takes over memory allocation, allowing wxDebugContext operations.

wxObject::operator delete

void delete(**void** *buf*)

The *delete* operator is defined for debugging versions of the library only, when the identifier __WXDEBUG__ is defined. It takes over memory deallocation, allowing wxDebugContext operations.

wxObjectRefData

This class is used to store reference-counted data. Derive classes from this to store your own data. When retrieving information from a **wxObject**'s reference data, you will need to cast to your own derived class.

Friends

wxObject (p. 750)

See also

wxObject (p. 750)

wxObjectRefData::m_count

int m_count

Reference count. When this goes to zero during a *wxObject::UnRef* (p. 753), an object

can delete the **wxObjectRefData** object.

wxObjectRefData::wxObjectRefData

wxObjectRefData()

Default constructor. Initialises the **m_count** member to 1.

wxObjectRefData::~wxObjectRefData

wxObjectRefData()

Destructor.

wxOutputStream

wxOutputStream is an abstract base class which may not be used directly.

Derived from

wxStreamBase (p. 1003)

Include files

<wx/stream.h>

wxOutputStream::wxOutputStream

wxOutputStream()

Creates a dummy wxOutputStream object.

wxOutputStream::~wxOutputStream

~wxOutputStream()

Destructor.

wxOutputStream::LastWrite

size_t LastWrite() **const**

Returns the number of bytes written during the last Write().

wxOutputStream::PutC

void PutC(**char** *c*)

Puts the specified character in the output queue and increments the stream position.

wxOutputStream::SeekO

off_t SeekO(**off_t** *pos*, **wxSeekMode** *mode*)

Changes the stream current position.

wxOutputStream::TellO

off_t TellO() **const**

Returns the current stream position.

wxOutputStream::Write

wxOutputStream& Write(**const void** **buffer*, **size_t** *size*)

Writes the specified amount of bytes using the data of *buffer*. *WARNING!* The buffer absolutely needs to have at least the specified size.

This function returns a reference on the current object, so the user can test any states of the stream right away.

wxOutputStream& Write(**wxInputStream&** *stream_in*)

Reads data from the specified input stream and stores them in the current stream. The data is read until an error is raised by one of the two streams.

wxPageSetupDialogData

This class holds a variety of information related to *wxPageSetupDialog* (p. 762).

It contains a *wxPrintData* (p. 796) member which is used to hold basic printer configuration data (as opposed to the user-interface configuration settings stored by wxPageSetupDialogData).

Derived from

wxObject (p. 750)

Include files

<wx/cmndata.h>

See also

wxPageSetupDialog (p. 762)

wxPageSetupDialogData::wxPageSetupDialogData

wxPageSetupDialogData()

Default constructor.

wxPageSetupDialogData(**wxPageSetupDialogData&** *data*)

Copy constructor.

wxPrintDialogData(**wxPrintData&** *printData*)

Construct an object from a print dialog data object.

wxPageSetupDialogData::~wxPageSetupDialogData

~wxPageSetupDialogData()

Destructor.

wxPageSetupDialogData::EnableHelp

void EnableHelp(**bool** *flag*)

Enables or disables the 'Help' button (Windows only).

wxPageSetupDialogData::EnableMargins

void EnableMargins(**bool** *flag*)

Enables or disables the margin controls (Windows only).

wxPageSetupDialogData::EnableOrientation

void EnableOrientation(**bool** *flag*)

Enables or disables the orientation control (Windows only).

wxPageSetupDialogData::EnablePaper

void EnablePaper(**bool** *flag*)

Enables or disables the paper size control (Windows only).

wxPageSetupDialogData::EnablePrinter

void EnablePrinter(**bool** *flag*)

Enables or disables the **Printer** button, which invokes a printer setup dialog.

wxPageSetupDialogData::GetDefaultMinMargins

bool GetDefaultMinMargins() **const**

Returns TRUE if the page setup dialog will take its minimum margin values from the currently selected printer properties. Windows only.

wxPageSetupDialogData::GetEnableMargins

bool GetEnableMargins() **const**

Returns TRUE if the margin controls are enabled (Windows only).

wxPageSetupDialogData::GetEnableOrientation

bool GetEnableOrientation() **const**

Returns TRUE if the orientation control is enabled (Windows only).

wxPageSetupDialogData::GetEnablePaper

bool GetEnablePaper() **const**

Returns TRUE if the paper size control is enabled (Windows only).

wxPageSetupDialogData::GetEnablePrinter

bool GetEnablePrinter() **const**

Returns TRUE if the printer setup button is enabled.

wxPageSetupDialogData::GetEnableHelp

bool GetEnableHelp() **const**

Returns TRUE if the printer setup button is enabled.

wxPageSetupDialogData::GetDefaultInfo

bool GetDefaultInfo() **const**

Returns TRUE if the dialog will simply return default printer information (such as orientation) instead of showing a dialog. Windows only.

wxPageSetupDialogData::GetMarginTopLeft

wxPoint GetMarginTopLeft() **const**

Returns the left (x) and top (y) margins in millimetres.

wxPageSetupDialogData::GetMarginBottomRight

wxPoint GetMarginBottomRight() **const**

Returns the right (x) and bottom (y) margins in millimetres.

wxPageSetupDialogData::GetMinMarginTopLeft

wxPoint GetMinMarginTopLeft() **const**

Returns the left (x) and top (y) minimum margins the user can enter (Windows only). Units are in millimetres

wxPageSetupDialogData::GetMinMarginBottomRight

wxPoint GetMinMarginBottomRight() const

Returns the right (x) and bottom (y) minimum margins the user can enter (Windows only). Units are in millimetres

wxPageSetupDialogData::GetPaperId

wxPaperSize GetPaperId() const

Returns the paper id (stored in the internal wxPrintData object).

For further information, see *wxPrintData::SetPaperId* (p. 799).

wxPageSetupDialogData::GetPaperSize

wxSize GetPaperSize() const

Returns the paper size in millimetres.

wxPageSetupDialogData::GetPrintData

wxPrintData& GetPrintData()

Returns a reference to the *print data* (p. 796) associated with this object.

wxPageSetupDialogData::SetDefaultInfo

void SetDefaultInfo(bool *flag*)

Pass TRUE if the dialog will simply return default printer information (such as orientation) instead of showing a dialog. Windows only.

wxPageSetupDialogData::SetDefaultMinMargins

void SetDefaultMinMargins(bool *flag*)

Pass TRUE if the page setup dialog will take its minimum margin values from the currently selected printer properties. Windows only. Units are in millimetres

wxPageSetupDialogData::SetMarginTopLeft

void GetMarginTopLeft(**const wxPoint&** *pt*)

Sets the left (x) and top (y) margins in millimetres.

wxPageSetupDialogData::SetMarginBottomRight

void SetMarginBottomRight(**const wxPoint&** *pt*)

Sets the right (x) and bottom (y) margins in millimetres.

wxPageSetupDialogData::SetMinMarginTopLeft

void SetMinMarginTopLeft(**const wxPoint&** *pt*)

Sets the left (x) and top (y) minimum margins the user can enter (Windows only). Units are in millimetres.

wxPageSetupDialogData::SetMinMarginBottomRight

void SetMinMarginBottomRight(**const wxPoint&** *pt*)

Sets the right (x) and bottom (y) minimum margins the user can enter (Windows only). Units are in millimetres.

wxPageSetupDialogData::SetPaperId

void SetPaperId(**wxPaperSize&** *id*)

Sets the paper size id. For further information, see *wxPrintData::SetPaperId* (p. 799).

Calling this function overrides the explicit paper dimensions passed in *wxPageSetupDialogData::SetPaperSize* (p. 761).

wxPageSetupDialogData::SetPaperSize

void SetPaperSize(**const wxSize&** *size*)

Sets the paper size in millimetres. If a corresponding paper id is found, it will be set in the internal wxPrintData object, otherwise the paper size overrides the paper id.

wxPageSetupDialogData::SetPrintData

void SetPrintData(**const wxPrintData&** *printData*)

Sets the *print data* (p. 796) associated with this object.

wxPageSetupDialogData::operator =

void operator =(**const wxPrintData&** *data*)

Assigns print data to this object.

void operator =(**const wxPageSetupDialogData&** *data*)

Assigns page setup data to this object.

wxPageSetupDialog

This class represents the page setup common dialog. The page setup dialog is standard from Windows 95 on, replacing the print setup dialog (which is retained in Windows and wxWindows for backward compatibility). On Windows 95 and NT 4.0 and above, the page setup dialog is native to the windowing system, otherwise it is emulated.

The page setup dialog contains controls for paper size (A4, A5 etc.), orientation (landscape or portrait), and controls for setting left, top, right and bottom margin sizes in millimetres.

When the dialog has been closed, you need to query the *wxPageSetupDialogData* (p. 756) object associated with the dialog.

Note that the OK and Cancel buttons do not destroy the dialog; this must be done by the application.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/printdlg.h>

See also

wxPrintDialog (p. 802), *wxPageSetupDialogData* (p. 756)

wxPageSetupDialog::wxPageSetupDialog

wxPageSetupDialog(**wxWindow*** *parent*, **wxPageSetupDialogData*** *data* = *NULL*)

Constructor. Pass a parent window, and optionally a pointer to a block of page setup data, which will be copied to the print dialog's internal data.

wxPageSetupDialog::~wxPageSetupDialog

~wxPageSetupDialog()

Destructor.

wxPageSetupDialog::GetPageSetupData

wxPageSetupDialogData& GetPageSetupData()

Returns the *page setup data* (p. 756) associated with the dialog.

wxPageSetupDialog::ShowModal

int ShowModal()

Shows the dialog, returning wxID_OK if the user pressed OK, and wxID_CANCEL otherwise.

wxPaintDC

A wxPaintDC must be constructed if an application wishes to paint on the client area of a window from within an **OnPaint** event. This should normally be constructed as a temporary stack object; don't store a wxPaintDC object. If you have an OnPaint handler, you *must* create a wxPaintDC object within it even if you don't actually use it.

Using wxPaintDC within OnPaint is important because it automatically sets the clipping area to the damaged area of the window. Attempts to draw outside this area do not appear.

To draw on a window from outside **OnPaint**, construct a *wxClientDC* (p. 121) object.

To draw on the whole window including decorations, construct a *wxWindowDC* (p. 1240)

object (Windows only).

Derived from

wxWindowDC (p. 1240)
wxDC (p. 282)

Include files

<wx/dcclient.h>

See also

wxDC (p. 282), *wxMemoryDC* (p. 682), *wxPaintDC* (p. 763), *wxWindowDC* (p. 1240), *wxScreenDC* (p. 906)

---

wxPaintDC::wxPaintDC

wxPaintDC(**wxWindow*** *window*)

Constructor. Pass a pointer to the window on which you wish to paint.

---

wxPaintEvent

A paint event is sent when a window's contents needs to be repainted.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a paint event, use this event handler macro to direct input to a member function that takes a wxPaintEvent argument.

EVT_PAINT(func)   Process a wxEVT_PAINT event.

See also

wxWindow::OnPaint (p. 1219), *Event handling overview* (p. 1372)

wxPaintEvent::wxPaintEvent

wxPaintEvent(**int** *id = 0*)

Constructor.

wxPalette

A palette is a table that maps pixel values to RGB colours. It allows the colours of a low-depth bitmap, for example, to be mapped to the available colours in a display.

Derived from

wxGDIObject (p. 477)
wxObject (p. 750)

Include files

<wx/palette.h>

Predefined objects

Objects:

wxNullPalette

See also

wxDC::SetPalette (p. 296), *wxBitmap* (p. 54)

wxPalette::wxPalette

wxPalette()

Default constructor.

wxPalette(**const wxPalette&** *palette*)

Copy constructor. This uses reference counting so is a cheap operation.

wxPalette(**int** *n*, **const unsigned char*** *red*,
const unsigned char* *green*, **const unsigned char*** *blue*)

Creates a palette from arrays of size *n*, one for each red, blue or green component.

Parameters

palette
    A pointer or reference to the palette to copy.

n
    The number of indices in the palette.

red
    An array of red values.

green
    An array of green values.

blue
    An array of blue values.

See also

wxPalette::Create (p. 766)

wxPalette::~wxPalette

~wxPalette()

Destructor.

wxPalette::Create

bool Create(**int** *n*, **const unsigned char*** *red*, **const unsigned char*** *green*, **const unsigned char*** *blue*)

Creates a palette from arrays of size *n*, one for each red, blue or green component.

Parameters

n
    The number of indices in the palette.

red
    An array of red values.

green
　　　An array of green values.

blue
　　　An array of blue values.

Return value

TRUE if the creation was successful, FALSE otherwise.

See also

wxPalette::wxPalette (p. 765)

wxPalette::GetPixel

int GetPixel(**const unsigned char** *red*, **const unsigned char** *green*, **const unsigned char** *blue*) **const**

Returns a pixel value (index into the palette) for the given RGB values.

Parameters

red
　　　Red value.

green
　　　Green value.

blue
　　　Blue value.

Return value

The nearest palette index.

See also

wxPalette::GetRGB (p. 767)

wxPalette::GetRGB

bool GetPixel(**int** *pixel*, **const unsigned char*** *red*, **const unsigned char*** *green*, **const unsigned char*** *blue*) **const**

Returns RGB values for a given palette index.

Parameters

pixel
    The palette index.

red
    Receives the red value.

green
    Receives the green value.

blue
    Receives the blue value.

Return value

TRUE if the operation was successful.

See also

wxPalette::GetPixel (p. 767)

wxPalette::Ok

bool Ok() **const**

Returns TRUE if palette data is present.

wxPalette::operator =

wxPalette& operator =(**const wxPalette&** *palette*)

Assignment operator, using reference counting. Returns a reference to 'this'.

wxPalette::operator ==

bool operator ==(**const wxPalette&** *palette*)

Equality operator. Two palettes are equal if they contain pointers to the same underlying palette data. It does not compare each attribute, so two independently-created palettes using the same parameters will fail the test.

wxPalette::operator !=

bool operator !=(**const wxPalette&** *palette*)

Inequality operator. Two palettes are not equal if they contain pointers to different underlying palette data. It does not compare each attribute.

wxPanel

A panel is a window on which controls are placed. It is usually placed within a frame. It contains minimal extra functionality over and above its parent class wxWindow; its main purpose is to be similar in appearance and functionality to a dialog, but with the flexibility of having any window as a parent.

Note: if not all characters are being intercepted by your OnKeyDown or OnChar handler, it may be because you are using the wxTAB_TRAVERSAL style, which grabs some keypresses for use by child controls.

Derived from

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/panel.h>

Window styles

There are no specific styles for this window.

See also *window styles overview* (p. 1379).

Remarks

By default, a panel has the same colouring as a dialog.

A panel may be loaded from a wxWindows resource file (extension `wxr`).

See also

wxDialog (p. 312)

wxPanel::wxPanel

wxPanel()

Default constructor.

 wxPanel(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* =
wxDefaultPosition, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* =
wxTAB_TRAVERSAL, **const wxString&** *name* = *"panel"*)

Constructor.

Parameters

parent
>The parent window.

id
>An identifier for the panel. A value of -1 is taken to mean a default.

pos
>The panel position. A value of (-1, -1) indicates a default position, chosen by either the windowing system or wxWindows, depending on platform.

size
>The panel size. A value of (-1, -1) indicates a default size, chosen by either the windowing system or wxWindows, depending on platform.

style
>The window style. See *wxPanel* (p. 769).

name
>Used to associate a name with the window, allowing the application user to set Motif resource values for individual dialog boxes.

See also

wxPanel::Create (p. 770)

wxPanel::~wxPanel

 ~wxPanel()

Destructor. Deletes any child windows before deleting the physical window.

wxPanel::Create

bool Create (**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* =
wxDefaultPosition, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* =
wxTAB_TRAVERSAL, **const wxString&** *name* = *"panel"*)

Used for two-step panel construction. See *wxPanel::wxPanel* (p. 769) for details.

wxPanel::GetDefaultItem

wxButton* GetDefaultItem() const

Returns a pointer to the button which is the default for this window, or NULL. The default button is the one activated by pressing the Enter key.

wxPanel::InitDialog

void InitDialog()

Sends an *wxWindow::OnInitDialog* (p. 1217) event, which in turn transfers data to the dialog via validators.

See also

wxWindow::OnInitDialog (p. 1217)

wxPanel::OnSysColourChanged

void OnSysColourChanged(wxSysColourChangedEvent& *event*)

The default handler for wxEVT_SYS_COLOUR_CHANGED.

Parameters

event
    The colour change event.

Remarks

Changes the panel's colour to conform to the current settings (Windows only). Add an event table entry for your panel class if you wish the behaviour to be different (such as keeping a user-defined background colour). If you do override this function, call *wxWindow::OnSysColourChanged* (p. 1222) to propagate the notification to child windows and controls.

See also

wxSysColourChangedEvent (p. 1039)

wxPanel::SetDefaultItem

void SetDefaultItem(wxButton *btn*)

Changes the default button for the panel.

See also

GetDefaultItem (p. 771)

wxPanelTabView

The wxPanelTabView is responsible for input and output on a wxPanel.

Derived from

wxTabView (p. 1049)
wxObject (p. 750)

Include files

<wx/tab.h>

See also

wxTabView overview (p. 1421), *wxTabView* (p. 1049)

wxPanelTabView::wxPanelTabView

void wxPanelTabView(**wxPanel** **panel*, **long** *style = wxTAB_STYLE_DRAW_BOX | wxTAB_STYLE_COLOUR_INTERIOR*)

Constructor. *panel* should be a wxTabbedPanel or wxTabbedDialog: the type will be checked by the view at run time.

style may be a bit list of the following:

wxTAB_STYLE_DRAW_BOX	Draw a box around the view area. Most commonly used for dialogs.
wxTAB_STYLE_COLOUR_INTERIOR	Draw tab backgrounds in the specified colour. Omitting this style will ensure that the tab background matches the dialog background.

wxPanelTabView::~wxPanelTabView

void ~wxPanelTabView()

Destructor. This destructor deletes all the panels associated with the view. If you do not wish this to happen, call ClearWindows with argument FALSE before the view is likely to be destroyed. This will clear the list of windows, without deleting them.

wxPanelTabView::AddTabWindow

void AddTabPanel(**int** *id*, **wxWindow *** *window*)

Adds a window to the view. The window is associated with the tab identifier, and will be shown or hidden as the tab is selected or deselected.

wxPanelTabView::ClearWindows

void ClearWindows(**bool** *deleteWindows = TRUE*)

Removes the child windows from the view. If *deleteWindows* is TRUE, the windows will be deleted.

wxPanelTabView::GetCurrentWindow

wxPanel * GetCurrentWindow()

Returns the child window currently being displayed on the tabbed panel or dialog box.

wxPanelTabView::GetTabWindow

wxWindow * GetTabWindow(**int** *id*)

Returns the window associated with the tab identifier.

wxPanelTabView::ShowWindowForTab

void ShowWindowForTab(**int** *id*)

Shows the child window corresponding to the tab identifier, and hides the previously shown window.

wxPathList

The path list is a convenient way of storing a number of directories, and when presented

with a filename without a directory, searching for an existing file in those directories. Storing the filename only in an application's files and using a locally-defined list of directories makes the application and its files more portable.

Use the *wxFileNameFromPath* global function to extract the filename from the path.

Derived from

wxList (p. 619)
wxObject (p. 750)

Include files

<wx/filefn.h>

See also

wxList (p. 619)

wxPathList::wxPathList

 wxPathList()

Constructor.

wxPathList::AddEnvList

void AddEnvList(**const wxString&** *env_variable*)

Finds the value of the given environment variable, and adds all paths to the path list. Useful for finding files in the PATH variable, for example.

wxPathList::Add

void Add(**const wxString&** *path*)

Adds the given directory to the path list, but does not check if the path was already on the list (use wxPathList::Member) for this).

wxPathList::EnsureFileAccessible

void EnsureFileAccessible(**const wxString&** *filename*)

Given a full filename (with path), ensures that files in the same path can be accessed

using the pathlist. It does this by stripping the filename and adding the path to the list if not already there.

wxPathList::FindAbsoluteValidPath

wxString FindAbsoluteValidPath(const wxString& *file*)

Searches for a full path for an existing file by appending *file* to successive members of the path list. If the file exists, a temporary pointer to the absolute path is returned.

wxPathList::FindValidPath

wxString FindValidPath(const wxString& *file*)

Searches for a full path for an existing file by appending *file* to successive members of the path list. If the file exists, a temporary pointer to the full path is returned. This path may be relative to the current working directory.

wxPathList::Member

bool Member(const wxString& *file*)

TRUE if the path is in the path list (ignoring case).

wxPen

A pen is a drawing tool for drawing outlines. It is used for drawing lines and painting the outline of rectangles, ellipses, etc. It has a colour, a width and a style.

Derived from

wxGDIObject (p. 477)
wxObject (p. 750)

Include files

<wx/pen.h>

Predefined objects

Objects:

wxNullPen

Pointers:

wxRED_PEN
wxCYAN_PEN
wxGREEN_PEN
wxBLACK_PEN
wxWHITE_PEN
wxTRANSPARENT_PEN
wxBLACK_DASHED_PEN
wxGREY_PEN
wxMEDIUM_GREY_PEN
wxLIGHT_GREY_PEN

Remarks

On a monochrome display, wxWindows shows all non-white pens as black.

Do not initialize objects on the stack before the program commences, since other required structures may not have been set up yet. Instead, define global pointers to objects and create them in *OnInit* or when required.

An application may wish to dynamically create pens with different characteristics, and there is the consequent danger that a large number of duplicate pens will be created. Therefore an application may wish to get a pointer to a pen by using the global list of pens **wxThePenList**, and calling the member function **FindOrCreatePen**. See the entry for *wxPenList* (p. 782).

wxPen uses a reference counting system, so assignments between brushes are very cheap. You can therefore use actual wxPen objects instead of pointers without efficiency problems. Once one wxPen object changes its data it will create its own pen data internally so that other pens, which previously shared the data using the reference counting, are not affected.

See also

wxPenList (p. 782), *wxDC* (p. 282), *wxDC::SetPen* (p. 299)

wxPen::wxPen

 wxPen()

Default constructor. The pen will be uninitialised, and *wxPen::Ok* (p. 780) will return FALSE.

 wxPen(**const wxColour&** *colour*, **int** *width*, **int** *style*)

Constructs a pen from a colour object, pen width and style.

wxPen(**const wxString&** *colourName*, **int** *width*, **int** *style*)

Constructs a pen from a colour name, pen width and style.

wxPen(**const wxBitmap&** *stipple*, **int** *width*)

Constructs a stippled pen from a stipple bitmap and a width.

wxPen(**const wxPen&** *pen*)

Copy constructor. This uses reference counting so is a cheap operation.

Parameters

colour
A colour object.

colourName
A colour name.

width
Pen width. Under Windows, the pen width cannot be greater than 1 if the style is wxDOT, wxLONG_DASH, wxSHORT_DASH, wxDOT_DASH, or wxUSER_DASH.

stipple
A stipple bitmap.

pen
A pointer or reference to a pen to copy.

style
The style may be one of the following:

wxSOLID	Solid style.
wxTRANSPARENT	No pen is used.
wxDOT	Dotted style.
wxLONG_DASH	Long dashed style.
wxSHORT_DASH	Short dashed style.
wxDOT_DASH	Dot and dash style.
wxSTIPPLE	Use the stipple bitmap.
wxUSER_DASH	Use the user dashes: see *wxPen::SetDashes* (p. 780).
wxBDIAGONAL_HATCH	Backward diagonal hatch.
wxCROSSDIAG_HATCH	Cross-diagonal hatch.
wxFDIAGONAL_HATCH	Forward diagonal hatch.
wxCROSS_HATCH	Cross hatch.
wxHORIZONTAL_HATCH	Horizontal hatch.
wxVERTICAL_HATCH	Vertical hatch.

Remarks

Different versions of Windows and different versions of other platforms support *very* different subsets of the styles above - there is no similarity even between Windows95 and Windows98 - so handle with care.

If the named colour form is used, an appropriate **wxColour** structure is found in the colour database.

See also

wxPen::SetStyle (p. 781), *wxPen::SetColour* (p. 780), *wxPen::SetWidth* (p. 781), *wxPen::SetStipple* (p. 781)

wxPen::~wxPen

 ~wxPen()

Destructor.

Remarks

The destructor may not delete the underlying pen object of the native windowing system, since wxBrush uses a reference counting system for efficiency.

Although all remaining pens are deleted when the application exits, the application should try to clean up all pens itself. This is because wxWindows cannot know if a pointer to the pen object is stored in an application data structure, and there is a risk of double deletion.

wxPen::GetCap

int GetCap() **const**

Returns the pen cap style, which may be one of **wxCAP_ROUND**, **wxCAP_PROJECTING** and **wxCAP_BUTT**. The default is **wxCAP_ROUND**.

See also

wxPen::SetCap (p. 780)

wxPen::GetColour

wxColour& GetColour() **const**

Returns a reference to the pen colour.

See also

wxPen::SetColour (p. 780)

wxPen::GetDashes

int GetDashes(**wxDash**** *dashes*) **const**

Gets an array of dashes (defined as char in X, DWORD under Windows).*dashes* is a pointer to the internal array. Do not deallocate or store this pointer. The function returns the number of dashes associated with this pen.

See also

wxPen::SetDashes (p. 780)

wxPen::GetJoin

int GetJoin() **const**

Returns the pen join style, which may be one of **wxJOIN_BEVEL**, **wxJOIN_ROUND** and **wxJOIN_MITER**. The default is **wxJOIN_ROUND**.

See also

wxPen::SetJoin (p. 781)

wxPen::GetStipple

wxBitmap* GetStipple() **const**

Gets a pointer to the stipple bitmap.

See also

wxPen::SetStipple (p. 781)

wxPen::GetStyle

int GetStyle() **const**

Returns the pen style.

See also

wxPen::wxPen (p. 776), *wxPen::SetStyle* (p. 781)

wxPen::GetWidth

int GetWidth() const

Returns the pen width.

See also

wxPen::SetWidth (p. 781)

wxPen::Ok

bool Ok() const

Returns TRUE if the pen is initialised.

wxPen::SetCap

void SetCap(int *capStyle*)

Sets the pen cap style, which may be one of **wxCAP_ROUND**, **wxCAP_PROJECTING** and **wxCAP_BUTT**. The default is **wxCAP_ROUND**.

See also

wxPen::GetCap (p. 778)

wxPen::SetColour

void SetColour(**wxColour&** *colour*)

void SetColour(**const wxString&** *colourName*)

void SetColour(**int** *red*, **int** *green*, **int** *blue*)

The pen's colour is changed to the given colour.

See also

wxPen::GetColour (p. 778)

wxPen::SetDashes

void SetDashes(**int** *n*, **wxDash*** *dashes*)

Associates an array of pointers to dashes (defined as char in X, DWORD under
Windows) with the pen. The array is not deallocated by wxPen, but neither must it be
deallocated by the calling application until the pen is deleted or this function is called
with a NULL array.

See also

wxPen::GetDashes (p. 779)

wxPen::SetJoin

void SetJoin(**int** *join_style*)

Sets the pen join style, which may be one of **wxJOIN_BEVEL**, **wxJOIN_ROUND** and
wxJOIN_MITER. The default is **wxJOIN_ROUND**.

See also

wxPen::GetJoin (p. 779)

wxPen::SetStipple

void SetStipple(**wxBitmap*** *stipple*)

Sets the bitmap for stippling.

See also

wxPen::GetStipple (p. 779)

wxPen::SetStyle

void SetStyle(**int** *style*)

Set the pen style.

See also

wxPen::wxPen (p. 776)

wxPen::SetWidth

void SetWidth(**int** *width*)

Sets the pen width.

See also

wxPen::GetWidth (p. 780)

wxPen::operator =

wxPen& operator =(**const wxPen&** *pen*)

Assignment operator, using reference counting. Returns a reference to 'this'.

wxPen::operator ==

bool operator ==(**const wxPen&** *pen*)

Equality operator. Two pens are equal if they contain pointers to the same underlying pen data. It does not compare each attribute, so two independently-created pens using the same parameters will fail the test.

wxPen::operator !=

bool operator !=(**const wxPen&** *pen*)

Inequality operator. Two pens are not equal if they contain pointers to different underlying pen data. It does not compare each attribute.

wxPenList

There is only one instance of this class: **wxThePenList**. Use this object to search for a previously created pen of the desired type and create it if not already found. In some windowing systems, the pen may be a scarce resource, so it can pay to reuse old resources if possible. When an application finishes, all pens will be deleted and their resources freed, eliminating the possibility of 'memory leaks'. However, it is best not to rely on this automatic cleanup because it can lead to double deletion in some circumstances.

There are two mechanisms in recent versions of wxWindows which make the pen list less useful than it once was. Under Windows, scarce resources are cleaned up internally if they are not being used. Also, a referencing counting mechanism applied to all GDI objects means that some sharing of underlying resources is possible. You don't have to keep track of pointers, working out when it is safe delete a pen, because the referencing counting does it for you. For example, you can set a pen in a device context, and then immediately delete the pen you passed, because the pen is 'copied'.

So you may find it easier to ignore the pen list, and instead create and copy pens as you

see fit. If your Windows resource meter suggests your application is using too many resources, you can resort to using GDI lists to share objects explicitly.

The only compelling use for the pen list is for wxWindows to keep track of pens in order to clean them up on exit. It is also kept for backward compatibility with earlier versions of wxWindows.

See also

wxPen (p. 775)

wxPenList::wxPenList

void wxPenList()

Constructor. The application should not construct its own pen list: use the object pointer **wxThePenList**.

wxPenList::AddPen

void AddPen(wxPen* *pen*)

Used internally by wxWindows to add a pen to the list.

wxPenList::FindOrCreatePen

wxPen* FindOrCreatePen(const wxColour& *colour*, int *width*, int *style*)

Finds a pen with the specified attributes and returns it, else creates a new pen, adds it to the pen list, and returns it.

wxPen* FindOrCreatePen(const wxString& *colourName*, int *width*, int *style*)

Finds a pen with the specified attributes and returns it, else creates a new pen, adds it to the pen list, and returns it.

Parameters

colour
> Colour object.

colourName
> Colour name, which should be in the *colour database* (p. 141).

width

Width of pen.

style
Pen style. See *wxPen::wxPen* (p. 776) for a list of styles.

wxPenList::RemovePen

void RemovePen(**wxPen*** *pen*)

Used by wxWindows to remove a pen from the list.

wxPlotCurve

The wxPlotCurve class represents a curve displayed in a *wxPlotWindow* (p. 786). It is a virtual curve, i.e. is acts only as an interface, leaving it to the programmer to care for how the values pairs are matched. wxPlotWindow and wxPlotCurve are designed to display large amounts of data, i.e. most typically data measured by some sort of machine.

This class is abstract, i.e. you have to derive your own class and implement the pure virtual functions (*GetStartX()* (p. 785), *GetEndX()* (p. 784)and *GetY()* (p. 785)).

Derived from

wxObject (p. 750)

wxPlotCurve::wxPlotCurve

wxPlotCurve(**int** *offsetY*, **double** *startY*, **double** *endY*)

Constructor assigning start values. See below for interpretation.

wxPlotCurve::GetEndX

wxInt32 GetEndX()

Must be overridden. This function should return the index of the last value of this curve, typically 99 if 100 values have been measured.

wxPlotCurve::GetEndY

double GetEndY()

See *SetStartY* (p. 785).

wxPlotCurve::GetOffsetY

int GetOffsetY()

Returns the vertical offset.

wxPlotCurve::GetY

double GetY(**wxInt32** *x*)

Must be overridden. This function will return the actual Y value corresponding to the given X value. The x value is of an integer type because it is considered to be an index in row of measured values.

wxPlotCurve::GetStartX

wxInt32 GetStartX()

Must be overridden. This function should return the index of the first value of this curve, typically zero.

wxPlotCurve::GetStartY

double GetStartY()

See *SetStartY* (p. 786).

wxPlotCurve::SetEndY

void SetEndY(**double** *endY*)

The value returned by this function tells the plot window what the highest values in the curve will be so that a suitable scale can be found for the display. If the Y values in this curve are in the range of -1.5 to 0.5, this function should return 0.5 or maybe 1.0 for nicer aesthetics.

wxPlotCurve::SetOffsetY

void SetOffsetY(**int** *offsetY*)

When displaying several curves in one window, it is often useful to assign different

offsets to the curves. You should call *wxPlotWindow::Move* (p. 788) to set this value after you have added the curve to the window.

wxPlotCurve::SetStartY

void SetStartY (**double** *startY*)

The value returned by this function tells the plot window what the lowest values in the curve will be so that a suitable scale can be found for the display. If the Y values in this curve are in the range of -1.5 to 0.5, this function should return -1.5 or maybe -2.0 for nicer aesthetics.

wxPlotWindow

wxPlotWindow is a specialized window designed to display data that typically has been measured by machines, i.e. that may have thousands of values. One example of such data would be the well known ECG measuring the electrical activity of your heart: the measuring device will produce thousands of values per minute, several measurements are done simultanously and you might want to have a look at parts of the curves, enlarging them or scrolling from one position to another. Note that this window is not useful for real-time measuring or for displaying charts with error bars etc.

A single curve in the plot window is represented by the *wxPlotCurve* (p. 784) class.

The wxPlotWindow interacts with program using events, for example when clicking or double clicking on a curve or when selecting one by clicking on it (which can be vetoed). Future versions will hopefully feature selecting values or sections of the displayed curves etc.

Derived from

wxScrolledWindow (p. 916)
wxPanel (p. 769)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Window styles

wxPLOT_BUTTON_MOVE	Display buttons to allao moving individual curves up or down.
wxPLOT_BUTTON_ENLARGE	Display buttons to allow enlarging individual curves vertically.
wxPLOT_BUTTON_ZOOM	Display buttons to allow zooming all curves horizontally.
wxPLOT_BUTTON_ALL	Display all buttons.

wxPLOT_Y_AXIS	Display an Y axis to the left of the drawing area.
wxPLOT_X_AXIS	Display a X axis at the bottom of the drawing area.
wxPLOT_DEFAULT	All of the above options.

wxPlotWindow::wxPlotWindow

wxPlotWindow()

wxPlotWindow(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos*, **const wxSize&** *size*, **int** *flags* = *wxPLOT_DEFAULT*)

Constructor.

wxPlotWindow::~wxPlotWindow

~wxPlotWindow()

The destructor will not delete the curves associated to the window.

wxPlotWindow::Add

void Add(**wxPlotCurve*** *curve*)

Add a curve to the window.

wxPlotWindow::GetCount

size_t GetCount()

Returns number of curves.

wxPlotWindow::GetAt

wxPlotCurve* GetAt(**size_t** *n*)

Get the nth curve.

wxPlotWindow::SetCurrent

void SetCurrent(**wxPlotCurve*** *current*)

Make one curve the current curve. This will emit a wxPlotEvent.

wxPlotWindow::GetCurrent

wxPlotCurve* GetCurrent()

Returns a pointer to the current curve, or NULL.

wxPlotWindow::Delete

void Delete(**wxPlotCurve*** *curve*)

Removes a curve from the window and delete is on screen. This does not delete the actual curve. If the curve removed was the current curve, the current curve will be set to NULL.

wxPlotWindow::Move

void Move(**wxPlotCurve*** *curve*, **int** *pixels_up*)

Move the curve `curve` up by `pixels_up` pixels. Down if the value is negative.

wxPlotWindow::Enlarge

void Enlarge(**wxPlotCurve*** *curve*, **double** *factor*)

Changes the representation of the given curve. A `factor` of more than one will stretch the curve vertically. The Y axis will change accordingly.

wxPlotWindow::SetUnitsPerValue

void SetUnitsPerValue(**double** *upv*)

This sets the virtual untis per value. Normally, you will not be interested in what measured value you see, but what it stands for. If you want to display seconds on the X axis and the measuring device produced 50 values per second, set this value to 50. This will affect all curves being displayed.

wxPlotWindow::GetUnitsPerValue

double GetUnitsPerValue()

See *SetUnitsPerValue* (p. 788).

wxPlotWindow::SetZoom

void SetZoom(**double** *zoom*)

This functions zooms all curves in their horizontal dimension. The X axis will be changed accordingly.

wxPlotWindow::GetZoom

double GetZoom()

See *SetZoom* (p. 789).

wxPlotWindow::RedrawEverything

void RedrawEverything()

Helper function which redraws both axes and the central area.

wxPlotWindow::RedrawXAxis

void RedrawXAxis()

Helper function which redraws the X axis.

wxPlotWindow::RedrawYAxis

void RedrawYAxis()

Helper function which redraws the Y axis.

wxPlotWindow::SetScrollOnThumbRelease

void SetScrollOnThumbRelease(**bool** *onrelease = TRUE*)

This function controls if the plot area will get scrolled only if the scrollbar thumb has been release or also if the thumb is being dragged. When displaying large amounts of data, it might become impossible to display the data fast enough to produce smooth scrolling and then this function should be called.

wxPlotWindow::SetEnlargeAroundWindowCentre

void SetEnlargeAroundWindowCentre(**bool** *aroundwindow = TRUE*)

Depending on the kind of data you display, enlarging the individual curves might have different desired effects. Sometimes, the data will be supposed to get enlarged with the fixed point being the origin, sometimes the fixed point should be the centre of the current drawing area. This function controls this behaviour.

wxPoint

A **wxPoint** is a useful data structure for graphics operations. It simply contains integer *x* and *y* members.

See also *wxRealPoint* (p. 872) for a floating point version.

Derived from

None

Include files

<wx/gdicmn.h>

See also

wxRealPoint (p. 872)

wxPoint::wxPoint

wxPoint()

wxPoint(**int** *x*, **int** *y*)

Create a point.

wxPoint::x

int x

x member.

wxPoint::y

int y

y member.

wxPostScriptDC

This defines the wxWindows Encapsulated PostScript device context, which can write PostScript files on any platform. See *wxDC* (p. 282) for descriptions of the member functions.

Derived from

wxDC (p. 282)
wxObject (p. 750)

Include files

<wx/dcps.h>

wxPostScriptDC::wxPostScriptDC

wxPostScriptDC(**const wxPrintData&** *printData*)

Constructs a PostScript printer device context from a *wxPrintData* (p. 796) object.

wxPostScriptDC(**const wxString&** *output*, **bool** *interactive = TRUE*,
wxWindow *parent)

Constructor. *output* is an optional file for printing to, and if *interactive* is TRUE a dialog box will be displayed for adjusting various parameters. *parent* is the parent of the printer dialog box.

Use the *Ok* member to test whether the constructor was successful in creating a useable device context.

See *Printer settings* (p. 1269) for functions to set and get PostScript printing settings.

This constructor and the global printer settings are now deprecated; use the wxPrintData constructor instead.

wxPostScriptDC::GetResolution

static int GetResolution()

Return resolution used in PostScript output. See *SetResolution* (p. 792).

wxPostScriptDC::SetResolution

static void SetResolution(int *ppi*)

Set resolution (in pixels per inch) that will be used in PostScript output. Default is 720ppi.

wxPreviewCanvas

A preview canvas is the default canvas used by the print preview system to display the preview.

Derived from

wxScrolledWindow (p. 916)
wxWindow (p. 1190)
wxevthandler (p. 380)
wxObject (p. 750)

Include files

<wx/print.h>

See also

wxPreviewFrame (p. 794), *wxPreviewControlBar* (p. 793), *wxPrintPreview* (p. 815)

wxPreviewCanvas::wxPreviewCanvas

wxPreviewCanvas(**wxPrintPreview*** *preview*, **wxWindow*** *parent*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "canvas"*)

Constructor.

wxPreviewCanvas::~wxPreviewCanvas

~wxPreviewCanvas()

Destructor.

wxPreviewCanvas::OnPaint

void OnPaint(**wxPaintEvent&** *event*)

Calls *wxPrintPreview::PaintPage* (p. 817) to refresh the canvas.

wxPreviewControlBar

This is the default implementation of the preview control bar, a panel with buttons and a zoom control. You can derive a new class from this and override some or all member functions to change the behaviour and appearance; or you can leave it as it is.

Derived from

wxPanel (p. 769)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/print.h>

See also

wxPreviewFrame (p. 794), *wxPreviewCanvas* (p. 792), *wxPrintPreview* (p. 815)

wxPreviewControlBar::wxPreviewControlbar

wxPreviewControlBar(**wxPrintPreview*** *preview*, **long** *buttons*, **wxWindow*** *parent*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "panel"*)

Constructor.

The buttons parameter may be a combination of the following, using the bitwise 'or' operator.

wxPREVIEW_PRINT   Create a print button.
wxPREVIEW_NEXT   Create a next page button.

wxPREVIEW_PREVIOUS	Create a previous page button.
wxPREVIEW_ZOOM	Create a zoom control.
wxPREVIEW_DEFAULT	Equivalent to a combination of wxPREVIEW_PREVIOUS, wxPREVIEW_NEXT and wxPREVIEW_ZOOM.

wxPreviewControlBar::~wxPreviewControlBar

~wxPreviewControlBar()

Destructor.

wxPreviewControlBar::CreateButtons

void CreateButtons()

Creates buttons, according to value of the button style flags.

wxPreviewControlBar::GetPrintPreview

wxPrintPreview * GetPrintPreview()

Gets the print preview object associated with the control bar.

wxPreviewControlBar::GetZoomControl

int GetZoomControl()

Gets the current zoom setting in percent.

wxPreviewControlBar::SetZoomControl

void SetZoomControl(**int** *percent*)

Sets the zoom control.

wxPreviewFrame

This class provides the default method of managing the print preview interface. Member functions may be overridden to replace functionality, or the class may be used without

derivation.

Derived from

wxFrame (p. 454)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/print.h>

See also

wxPreviewCanvas (p. 792), *wxPreviewControlBar* (p. 793), *wxPrintPreview* (p. 815)

wxPreviewFrame::wxPreviewFrame

wxPreviewFrame (**wxPrintPreview*** *preview*, **wxFrame*** *parent*, **const wxString&** *title*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize& size** *size* = *wxDefaultSize*, **long** *style* = *wxDEFAULT_FRAME_STYLE*, **const wxString&** *name* = *"frame"*)

Constructor. Pass a print preview object plus other normal frame arguments.

wxPreviewFrame::~wxPreviewFrame

~wxPreviewFrame ()

Destructor.

wxPreviewFrame::CreateControlBar

void CreateControlBar()

Creates a wxPreviewControlBar. Override this function to allow a user-defined preview control bar object to be created.

wxPreviewFrame::CreateCanvas

void CreateCanvas()

Creates a wxPreviewCanvas. Override this function to allow a user-defined preview canvas object to be created.

wxPreviewFrame::Initialize

void Initialize()

Creates the preview canvas and control bar, and calls wxWindow::MakeModal(TRUE) to disable other top-level windows in the application.

This function should be called by the application prior to showing the frame.

wxPreviewFrame::OnCloseWindow

void OnCloseWindow(**wxCloseEvent&** *event*)

Enables the other frames in the application, and deletes the print preview object, implicitly deleting any printout objects associated with the print preview object.

wxPrintData

This class holds a variety of information related to printers and printer device contexts. This class is used to create a wxPrinterDC and a wxPostScriptDC. It is also used as a data member of wxPrintDialogData and wxPageSetupDialogData, as part of the mechanism for transferring data between the print dialogs and the application.

Derived from

wxObject (p. 750)

Include files

<wx/cmndata.h>

See also

wxPrintDialog (p. 802), *wxPageSetupDialog* (p. 762), *wxPrintDialogData* (p. 803), *wxPageSetupDialogData* (p. 756), *wxPrintDialog Overview* (p. 1409), *wxPrinterDC* (p. 810), *wxPostScriptDC* (p. 791)

Remarks

The following functions are specific to PostScript printing and have not yet been documented:

```
const wxString& GetPrinterCommand() const ;
const wxString& GetPrinterOptions() const ;
```

```
const wxString& GetPreviewCommand() const ;
const wxString& GetFilename() const ;
const wxString& GetFontMetricPath() const ;
double GetPrinterScaleX() const ;
double GetPrinterScaleY() const ;
long GetPrinterTranslateX() const ;
long GetPrinterTranslateY() const ;
// wxPRINT_MODE_PREVIEW, wxPRINT_MODE_FILE, wxPRINT_MODE_PRINTER
wxPrintMode GetPrintMode() const ;

void SetPrinterCommand(const wxString& command) ;
void SetPrinterOptions(const wxString& options) ;
void SetPreviewCommand(const wxString& command) ;
void SetFilename(const wxString& filename) ;
void SetFontMetricPath(const wxString& path) ;
void SetPrinterScaleX(double x) ;
void SetPrinterScaleY(double y) ;
void SetPrinterScaling(double x, double y) ;
void SetPrinterTranslateX(long x) ;
void SetPrinterTranslateY(long y) ;
void SetPrinterTranslation(long x, long y) ;
void SetPrintMode(wxPrintMode printMode) ;
```

wxPrintData::wxPrintData

wxPrintData()

Default constructor.

wxPrintData(**const wxPrintData&** *data*)

Copy constructor.

wxPrintData::~wxPrintData

~wxPrintData()

Destructor.

wxPrintData::GetCollate

bool GetCollate() **const**

Returns TRUE if collation is on.

wxPrintData::GetColour

bool GetColour() const

Returns TRUE if colour printing is on.

wxPrintData::GetDuplex

wxDuplexMode GetDuplex() const

Returns the duplex mode. One of wxDUPLEX_SIMPLEX, wxDUPLEX_HORIZONTAL, wxDUPLEX_VERTICAL.

wxPrintData::GetNoCopies

int GetNoCopies() const

Returns the number of copies requested by the user.

wxPrintData::GetOrientation

int GetOrientation() const

Gets the orientation. This can be wxLANDSCAPE or wxPORTRAIT.

wxPrintData::GetPaperId

wxPaperSize GetPaperId() const

Returns the paper size id. For more information, see *wxPrintData::SetPaperId* (p. 799).

wxPrintData::GetPrinterName

const wxString& GetPrinterName() const

Returns the printer name. If the printer name is the empty string, it indicates that the default printer should be used.

wxPrintData::GetQuality

wxPaperQuality GetQuality() const

Returns the current print quality. This can be a positive integer, denoting the number of dots per inch, or one of the following identifiers:

```
wxPRINT\_QUALITY\_HIGH
wxPRINT\_QUALITY\_MEDIUM
wxPRINT\_QUALITY\_LOW
wxPRINT\_QUALITY\_DRAFT
```

On input you should pass one of these identifiers, but on return you may get back a
positive integer indicating the current resolution setting.

wxPrintData::SetCollate

void SetCollate(**bool** *flag*)

Sets collation to on or off.

wxPrintData::SetColour

void SetColour(**bool** *flag*)

Sets colour printing on or off.

wxPrintData::SetDuplex

void SetDuplex(**wxDuplexMode** *mode*)

Returns the duplex mode. One of wxDUPLEX_SIMPLEX, wxDUPLEX_HORIZONTAL,
wxDUPLEX_VERTICAL.

wxPrintData::SetNoCopies

void SetNoCopies(**int** *n*)

Sets the default number of copies to be printed out.

wxPrintData::SetOrientation

void SetOrientation(**int** *orientation*)

Sets the orientation. This can be wxLANDSCAPE or wxPORTRAIT.

wxPrintData::SetPaperId

void SetPaperId(**wxPaperSize** *paperId*)

Sets the paper id. This indicates the type of paper to be used. For a mapping between paper id, paper size and string name, see wxPrintPaperDatabase in `paper.h` (not yet documented).

paperId can be one of:

```
    wxPAPER_NONE,                 // Use specific dimensions
    wxPAPER_LETTER,               // Letter, 8 1/2 by 11 inches
    wxPAPER_LEGAL,                // Legal, 8 1/2 by 14 inches
    wxPAPER_A4,                   // A4 Sheet, 210 by 297 millimeters
    wxPAPER_CSHEET,               // C Sheet, 17 by 22 inches
    wxPAPER_DSHEET,               // D Sheet, 22 by 34 inches
    wxPAPER_ESHEET,               // E Sheet, 34 by 44 inches
    wxPAPER_LETTERSMALL,          // Letter Small, 8 1/2 by 11 inches
    wxPAPER_TABLOID,              // Tabloid, 11 by 17 inches
    wxPAPER_LEDGER,               // Ledger, 17 by 11 inches
    wxPAPER_STATEMENT,            // Statement, 5 1/2 by 8 1/2 inches
    wxPAPER_EXECUTIVE,            // Executive, 7 1/4 by 10 1/2 inches
    wxPAPER_A3,                   // A3 sheet, 297 by 420 millimeters
    wxPAPER_A4SMALL,              // A4 small sheet, 210 by 297
millimeters
    wxPAPER_A5,                   // A5 sheet, 148 by 210 millimeters
    wxPAPER_B4,                   // B4 sheet, 250 by 354 millimeters
    wxPAPER_B5,                   // B5 sheet, 182-by-257-millimeter
paper
    wxPAPER_FOLIO,                // Folio, 8-1/2-by-13-inch paper
    wxPAPER_QUARTO,               // Quarto, 215-by-275-millimeter paper
    wxPAPER_10X14,                // 10-by-14-inch sheet
    wxPAPER_11X17,                // 11-by-17-inch sheet
    wxPAPER_NOTE,                 // Note, 8 1/2 by 11 inches
    wxPAPER_ENV_9,                // #9 Envelope, 3 7/8 by 8 7/8 inches
    wxPAPER_ENV_10,               // #10 Envelope, 4 1/8 by 9 1/2 inches
    wxPAPER_ENV_11,               // #11 Envelope, 4 1/2 by 10 3/8 inches
    wxPAPER_ENV_12,               // #12 Envelope, 4 3/4 by 11 inches
    wxPAPER_ENV_14,               // #14 Envelope, 5 by 11 1/2 inches
    wxPAPER_ENV_DL,               // DL Envelope, 110 by 220 millimeters
    wxPAPER_ENV_C5,               // C5 Envelope, 162 by 229 millimeters
    wxPAPER_ENV_C3,               // C3 Envelope, 324 by 458 millimeters
    wxPAPER_ENV_C4,               // C4 Envelope, 229 by 324 millimeters
    wxPAPER_ENV_C6,               // C6 Envelope, 114 by 162 millimeters
    wxPAPER_ENV_C65,              // C65 Envelope, 114 by 229 millimeters
    wxPAPER_ENV_B4,               // B4 Envelope, 250 by 353 millimeters
    wxPAPER_ENV_B5,               // B5 Envelope, 176 by 250 millimeters
    wxPAPER_ENV_B6,               // B6 Envelope, 176 by 125 millimeters
    wxPAPER_ENV_ITALY,            // Italy Envelope, 110 by 230
millimeters
    wxPAPER_ENV_MONARCH,          // Monarch Envelope, 3 7/8 by 7 1/2
inches
    wxPAPER_ENV_PERSONAL,         // 6 3/4 Envelope, 3 5/8 by 6 1/2
inches
    wxPAPER_FANFOLD_US,           // US Std Fanfold, 14 7/8 by 11 inches
    wxPAPER_FANFOLD_STD_GERMAN,   // German Std Fanfold, 8 1/2 by 12
inches
    wxPAPER_FANFOLD_LGL_GERMAN,   // German Legal Fanfold, 8 1/2 by 13
inches
```

```
Windows 95 only:
    wxPAPER_ISO_B4,                 // B4 (ISO) 250 x 353 mm
    wxPAPER_JAPANESE_POSTCARD,      // Japanese Postcard 100 x 148 mm
    wxPAPER_9X11,                   // 9 x 11 in
    wxPAPER_10X11,                  // 10 x 11 in
    wxPAPER_15X11,                  // 15 x 11 in
    wxPAPER_ENV_INVITE,             // Envelope Invite 220 x 220 mm
    wxPAPER_LETTER_EXTRA,           // Letter Extra 9 \275 x 12 in
    wxPAPER_LEGAL_EXTRA,            // Legal Extra 9 \275 x 15 in
    wxPAPER_TABLOID_EXTRA,          // Tabloid Extra 11.69 x 18 in
    wxPAPER_A4_EXTRA,               // A4 Extra 9.27 x 12.69 in
    wxPAPER_LETTER_TRANSVERSE,      // Letter Transverse 8 \275 x 11 in
    wxPAPER_A4_TRANSVERSE,          // A4 Transverse 210 x 297 mm
    wxPAPER_LETTER_EXTRA_TRANSVERSE, // Letter Extra Transverse 9\275 x
12 in
    wxPAPER_A_PLUS,                 // SuperA/SuperA/A4 227 x 356 mm
    wxPAPER_B_PLUS,                 // SuperB/SuperB/A3 305 x 487 mm
    wxPAPER_LETTER_PLUS,            // Letter Plus 8.5 x 12.69 in
    wxPAPER_A4_PLUS,                // A4 Plus 210 x 330 mm
    wxPAPER_A5_TRANSVERSE,          // A5 Transverse 148 x 210 mm
    wxPAPER_B5_TRANSVERSE,          // B5 (JIS) Transverse 182 x 257 mm
    wxPAPER_A3_EXTRA,               // A3 Extra 322 x 445 mm
    wxPAPER_A5_EXTRA,               // A5 Extra 174 x 235 mm
    wxPAPER_B5_EXTRA,               // B5 (ISO) Extra 201 x 276 mm
    wxPAPER_A2,                     // A2 420 x 594 mm
    wxPAPER_A3_TRANSVERSE,          // A3 Transverse 297 x 420 mm
    wxPAPER_A3_EXTRA_TRANSVERSE     // A3 Extra Transverse 322 x 445 mm
```

wxPrintData::SetPrinterName

void SetPrinterName (**const wxString&** *printerName*)

Sets the printer name. This can be the empty string to indicate that the default printer should be used.

wxPrintData::SetQuality

void SetQuality(**wxPaperQuality** *quality*)

Sets the desired print quality. This can be a positive integer, denoting the number of dots per inch, or one of the following identifiers:

```
wxPRINT\_QUALITY\_HIGH
wxPRINT\_QUALITY\_MEDIUM
wxPRINT\_QUALITY\_LOW
wxPRINT\_QUALITY\_DRAFT
```

On input you should pass one of these identifiers, but on return you may get back a positive integer indicating the current resolution setting.

wxPrintData::operator =

void operator =(**const wxPrintData&** *data*)

Assigns print data to this object.

void operator =(**const wxPrintSetupData&** *data*)

Assigns print setup data to this object. wxPrintSetupData is deprecated, but retained for backward compatibility.

wxPrintDialog

This class represents the print and print setup common dialogs. You may obtain a *wxPrinterDC* (p. 810) device context from a successfully dismissed print dialog.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/printdlg.h>

See also

wxPrintDialog Overview (p. 1409)

wxPrintDialog::wxPrintDialog

wxPrintDialog(**wxWindow*** *parent*, **wxPrintDialogData*** *data* = *NULL*)

Constructor. Pass a parent window, and optionally a pointer to a block of print data, which will be copied to the print dialog's print data.

See also

wxPrintDialogData (p. 803)

wxPrintDialog::~wxPrintDialog

~wxPrintDialog()

Destructor. If wxPrintDialog::GetPrintDC has *not* been called, the device context obtained by the dialog (if any) will be deleted.

wxPrintDialog::GetPrintDialogData

wxPrintDialogData& GetPrintDialogData()

Returns the *print dialog data* (p. 803) associated with the print dialog.

wxPrintDialog::GetPrintDC

wxDC* GetPrintDC()

Returns the device context created by the print dialog, if any. When this function has been called, the ownership of the device context is transferred to the application, so it must then be deleted explicitly.

wxPrintDialog::ShowModal

int ShowModal()

Shows the dialog, returning wxID_OK if the user pressed OK, and wxID_CANCEL otherwise. After this function is called, a device context may be retrievable using *wxPrintDialog::GetPrintDC* (p. 803).

wxPrintDialogData

This class holds information related to the visual characteristics of wxPrintDialog. It contains a wxPrintData object with underlying printing settings.

Derived from

wxObject (p. 750)

Include files

<wx/cmndata.h>

See also

wxPrintDialog (p. 802), *wxPrintDialog Overview* (p. 1409)

wxPrintDialogData::wxPrintDialogData

wxPrintDialogData()

Default constructor.

wxPrintDialogData(**wxPrintDialogData&** *dialogData*)

Copy constructor.

wxPrintDialogData(**wxPrintData&** *printData*)

Construct an object from a print dialog data object.

wxPrintDialogData::~wxprintdialogdata

~wxPrintDialogData()

Destructor.

wxPrintDialogData::EnableHelp

void EnableHelp(**bool** *flag*)

Enables or disables the 'Help' button.

wxPrintDialogData::EnablePageNumbers

void EnablePageNumbers(**bool** *flag*)

Enables or disables the 'Page numbers' controls.

wxPrintDialogData::EnablePrintToFile

void EnablePrintToFile(**bool** *flag*)

Enables or disables the 'Print to file' checkbox.

wxPrintDialogData::EnableSelection

void EnableSelection(**bool** *flag*)

Enables or disables the 'Selection' radio button.

wxPrintDialogData::GetAllPages

bool GetAllPages() **const**

Returns TRUE if the user requested that all pages be printed.

wxPrintDialogData::GetCollate

bool GetCollate() **const**

Returns TRUE if the user requested that the document(s) be collated.

wxPrintDialogData::GetFromPage

int GetFromPage() **const**

Returns the *from* page number, as entered by the user.

wxPrintDialogData::GetMaxPage

int GetMaxPage() **const**

Returns the *maximum* page number.

wxPrintDialogData::GetMinPage

int GetMinPage() **const**

Returns the *minimum* page number.

wxPrintDialogData::GetNoCopies

int GetNoCopies() **const**

Returns the number of copies requested by the user.

wxPrintDialogData::GetPrintData

wxPrintData& GetPrintData()

Returns a reference to the internal wxPrintData object.

wxPrintDialogData::GetPrintToFile

bool GetPrintToFile() const

Returns TRUE if the user has selected printing to a file.

wxPrintDialogData::GetSelection

bool GetSelection() const

Returns TRUE if the user requested that the selection be printed (where 'selection' is a concept specific to the application).

wxPrintDialogData::GetToPage

int GetToPage() const

Returns the *to* page number, as entered by the user.

wxPrintDialogData::SetCollate

void SetCollate(bool *flag*)

Sets the 'Collate' checkbox to TRUE or FALSE.

wxPrintDialogData::SetFromPage

void SetFromPage(int *page*)

Sets the *from* page number.

wxPrintDialogData::SetMaxPage

void SetMaxPage(int *page*)

Sets the *maximum* page number.

wxPrintDialogData::SetMinPage

void SetMinPage(**int** *page*)

Sets the *minimum* page number.

wxPrintDialogData::SetNoCopies

void SetNoCopies(**int** *n*)

Sets the default number of copies the user has requested to be printed out.

wxPrintDialogData::SetPrintData

void SetPrintData(**const wxPrintData&** *printData*)

Sets the internal wxPrintData.

wxPrintDialogData::SetPrintToFile

void SetPrintToFile(**bool** *flag*)

Sets the 'Print to file' checkbox to TRUE or FALSE.

wxPrintDialogData::SetSelection

void SetSelection(**bool** *flag*)

Selects the 'Selection' radio button. The effect of printing the selection depends on how the application implements this command, if at all.

wxPrintDialogData::SetSetupDialog

void SetSetupDialog(**bool** *flag*)

Determines whether the dialog to be shown will be the Print dialog (pass FALSE) or Print Setup dialog (pass TRUE).

Note that the setup dialog is (according to Microsoft) obsolete from Windows 95, though retained for backward compatibility.

wxPrintDialogData::SetToPage

void SetToPage(**int** *page*)

Sets the *to* page number.

wxPrintDialogData::operator =

void operator =(**const wxPrintData&** *data*)

Assigns print data to this object.

void operator =(**const wxPrintDialogData&** *data*)

Assigns another print dialog data object to this object.

wxPrinter

This class represents the Windows or PostScript printer, and is the vehicle through which printing may be launched by an application. Printing can also be achieved through using of lower functions and classes, but this and associated classes provide a more convenient and general method of printing.

Derived from

wxObject (p. 750)

Include files

<wx/print.h>

See also

Printing framework overview (p. 1428), *wxPrinterDC* (p. 810), *wxPrintDialog* (p. 802), *wxPrintout* (p. 811), *wxPrintPreview* (p. 815).

wxPrinter::wxPrinter

wxPrinter(**wxPrintDialogData*** *data* = *NULL*)

Constructor. Pass an optional pointer to a block of print dialog data, which will be copied to the printer object's local data.

See also

wxPrintDialogData (p. 803), *wxPrintData* (p. 796)

wxPrinter::~wxPrinter

 ~wxPrinter()

Destructor.

wxPrinter::Abort

 bool Abort()

Returns TRUE if the user has aborted the print job.

wxPrinter::CreateAbortWindow

 void CreateAbortWindow(**wxWindow*** *parent*, **wxPrintout*** *printout*)

Creates the default printing abort window, with a cancel button.

wxPrinter::GetLastError

 static wxPrinterError GetLastError()

Return last error. Valid after calling *Print* (p. 809), *PrintDialog* (p. 810) or
wxPrintPreview::Print (p. 818). These functions set last error to
wxPRINTER_NO_ERROR if no error happened.

Returned value is one of the following:

wxPRINTER_NO_ERROR	No error happened.
wxPRINTER_CANCELLED	The user cancelled printing.
wxPRINTER_ERROR	There was an error during printing.

wxPrinter::GetPrintDialogData

 wxPrintDialogData& GetPrintDialogData()

Returns the *print data* (p. 796) associated with the printer object.

wxPrinter::Print

bool Print(**wxWindow** *parent, **wxPrintout** *printout, **bool** *prompt=TRUE*)

Starts the printing process. Provide a parent window, a user-defined wxPrintout object which controls the printing of a document, and whether the print dialog should be invoked first.

Print could return FALSE if there was a problem initializing the printer device context (current printer not set, for example) or the user cancelled printing. Call *wxPrinter::GetLastError* (p. 809) to get detailed information about the kind of the error.

wxPrinter::PrintDialog

wxDC* PrintDialog(**wxWindow** *parent)

Invokes the print dialog. If successful (the user did not press Cancel and no error occurred), a suitable device context will be returned (otherwise NULL is returned -- call *wxPrinter::GetLastError* (p. 809) to get detailed information about the kind of the error).

The application must delete this device context to avoid a memory leak.

wxPrinter::ReportError

void ReportError(**wxWindow** *parent, **wxPrintout** *printout, **const wxString&** *message*)

Default error-reporting function.

wxPrinter::Setup

bool Setup(**wxWindow** *parent)

Invokes the print setup dialog. Note that the setup dialog is obsolete from Windows 95, though retained for backward compatibility.

wxPrinterDC

A printer device context is specific to Windows, and allows access to any printer with a Windows driver. See *wxDC* (p. 282) for further information on device contexts, and *wxDC::GetSize* (p. 293) for advice on achieving the correct scaling for the page.

Derived from

wxDC (p. 282)
wxObject (p. 282)

Include files

<wx/dcprint.h>

See also

wxDC (p. 282), *Printing framework overview* (p. 1428)

wxPrinterDC::wxPrinterDC

wxPrinterDC(**const wxPrintData&** *printData*)

Pass a *wxPrintData* (p. 796) object with information necessary for setting up a suitable printer device context. This is the recommended way to construct a wxPrinterDC.

wxPrinterDC(**const wxString&** *driver*, **const wxString&** *device*, **const wxString&** *output*, **const bool** *interactive = TRUE*, **int** *orientation = wxPORTRAIT*)

Constructor. With empty strings for the first three arguments, the default printer dialog is displayed. *device* indicates the type of printer and *output* is an optional file for printing to. The *driver* parameter is currently unused. Use the *Ok* member to test whether the constructor was successful in creating a useable device context.

This constructor is deprecated and retained only for backward compatibility.

wxPrintout

This class encapsulates the functionality of printing out an application document. A new class must be derived and members overridden to respond to calls such as OnPrintPage and HasPage. Instances of this class are passed to wxPrinter::Print or a wxPrintPreview object to initiate printing or previewing.

Derived from

wxObject (p. 750)

Include files

<wx/print.h>

See also

Printing framework overview (p. 1428), *wxPrinterDC* (p. 810), *wxPrintDialog* (p. 802), *wxPrinter* (p. 808), *wxPrintPreview* (p. 815)

wxPrintout::wxPrintout

wxPrintout(**const wxString&** *title = "Printout"*)

Constructor. Pass an optional title argument (currently unused).

wxPrintout::~wxPrintout

~wxPrintout()

Destructor.

wxPrintout::GetDC

wxDC * GetDC()

Returns the device context associated with the printout (given to the printout at start of printing or previewing). This will be a wxPrinterDC if printing under Windows, a wxPostScriptDC if printing on other platforms, and a wxMemoryDC if previewing.

wxPrintout::GetPageInfo

void GetPageInfo(**int ***minPage*, **int ***maxPage*, **int ***pageFrom*, **int ***pageTo*)

Called by the framework to obtain information from the application about minimum and maximum page values that the user can select, and the required page range to be printed. By default this returns 1, 32000 for the page minimum and maximum values, and 1, 1 for the required page range.

If *minPage* is zero, the page number controls in the print dialog will be disabled.

wxPython note: When this method is implemented in a derived Python class, it should be designed to take no parameters (other than the self reference) and to return a tuple of four integers.

wxPrintout::GetPageSizeMM

void GetPageSizeMM(**int ***w,* **int ***h*)

Returns the size of the printer page in millimetres.

wxPython note: This method returns the output-only parameters as a tuple.

wxPrintout::GetPageSizePixels

void GetPageSizePixels(**int ****w*, **int ****h*)

Returns the size of the printer page in pixels. These may not be the same as the values returned from *wxDC::GetSize* (p. 293) if the printout is being used for previewing, since in this case, a memory device context is used, using a bitmap size reflecting the current preview zoom. The application must take this discrepancy into account if previewing is to be supported.

wxPython note: This method returns the output-only parameters as a tuple.

wxPrintout::GetPPIPrinter

void GetPPIPrinter(**int ****w*, **int ****h*)

Returns the number of pixels per logical inch of the printer device context. Dividing the printer PPI by the screen PPI can give a suitable scaling factor for drawing text onto the printer. Remember to multiply this by a scaling factor to take the preview DC size into account.

wxPython note: This method returns the output-only parameters as a tuple.

wxPrintout::GetPPIScreen

void GetPPIScreen(**int ****w*, **int ****h*)

Returns the number of pixels per logical inch of the screen device context. Dividing the printer PPI by the screen PPI can give a suitable scaling factor for drawing text onto the printer. Remember to multiply this by a scaling factor to take the preview DC size into account.

wxPython note: This method returns the output-only parameters as a tuple.

wxPrintout::HasPage

bool HasPage(**int** *pageNum*)

Should be overridden to return TRUE if the document has this page, or FALSE if not. Returning FALSE signifies the end of the document. By default, HasPage behaves as if the document has only one page.

wxPrintout::IsPreview

bool IsPreview()

Returns TRUE if the printout is currently being used for previewing.

wxPrintout::OnBeginDocument

bool OnBeginDocument(**int** *startPage*, **int** *endPage*)

Called by the framework at the start of document printing. Return FALSE from this function cancels the print job. OnBeginDocument is called once for every copy printed.

The base wxPrintout::OnBeginDocument *must* be called (and the return value checked) from within the overridden function, since it calls wxDC::StartDoc.

wxPython note: If this method is overridden in a Python class then the base class version can be called by using the method `base_OnBeginDocument(startPage, endPage)`.

wxPrintout::OnEndDocument

void OnEndDocument()

Called by the framework at the end of document printing. OnEndDocument is called once for every copy printed.

The base wxPrintout::OnEndDocument *must* be called from within the overridden function, since it calls wxDC::EndDoc.

wxPrintout::OnBeginPrinting

void OnBeginPrinting()

Called by the framework at the start of printing. OnBeginPrinting is called once for every print job (regardless of how many copies are being printed).

wxPrintout::OnEndPrinting

void OnEndPrinting()

Called by the framework at the end of printing. OnEndPrinting is called once for every print job (regardless of how many copies are being printed).

wxPrintout::OnPreparePrinting

void OnPreparePrinting()

Called once by the framework before any other demands are made of the wxPrintout object. This gives the object an opportunity to calculate the number of pages in the document, for example.

wxPrintout::OnPrintPage

bool OnPrintPage(**int** *pageNum*)

Called by the framework when a page should be printed. Returning FALSE cancels the print job. The application can use wxPrintout::GetDC to obtain a device context to draw on.

wxPrintPreview

Objects of this class manage the print preview process. The object is passed a wxPrintout object, and the wxPrintPreview object itself is passed to a wxPreviewFrame object. Previewing is started by initializing and showing the preview frame. Unlike wxPrinter::Print, flow of control returns to the application immediately after the frame is shown.

Derived from

wxObject (p. 750)

Include files

<wx/print.h>

See also

Printing framework overview (p. 1428), *wxPrinterDC* (p. 810), *wxPrintDialog* (p. 802), *wxPrintout* (p. 811), *wxPrinter* (p. 808), *wxPreviewCanvas* (p. 792), *wxPreviewControlBar* (p. 793), *wxPreviewFrame* (p. 794).

wxPrintPreview::wxPrintPreview

wxPrintPreview(**wxPrintout*** *printout*, **wxPrintout*** *printoutForPrinting*,**wxPrintData*** *data=NULL*)

Constructor. Pass a printout object, an optional printout object to be used for actual printing, and the address of an optional block of printer data, which will be copied to the print preview object's print data.

If *printoutForPrinting* is non-NULL, a **Print...** button will be placed on the preview frame so that the user can print directly from the preview interface.

Do not explicitly delete the printout objects once this destructor has been called, since they will be deleted in the wxPrintPreview constructor. The same does not apply to the *data* argument.

Test the Ok member to check whether the wxPrintPreview object was created correctly. Ok could return FALSE if there was a problem initializing the printer device context (current printer not set, for example).

wxPrintPreview::~wxPrintPreview

~wxPrinter()

Destructor. Deletes both print preview objects, so do not destroy these objects in your application.

wxPrintPreview::DrawBlankPage

bool DrawBlankPage(**wxWindow*** *window*)

Draws a representation of the blank page into the preview window. Used internally.

wxPrintPreview::GetCanvas

wxWindow* GetCanvas()

Gets the preview window used for displaying the print preview image.

wxPrintPreview::GetCurrentPage

int GetCurrentPage()

Gets the page currently being previewed.

wxPrintPreview::GetFrame

wxFrame * GetFrame()

Gets the frame used for displaying the print preview canvas and control bar.

wxPrintPreview::GetMaxPage

int GetMaxPage()

Returns the maximum page number.

wxPrintPreview::GetMinPage

int GetMinPage()

Returns the minimum page number.

wxPrintPreview::GetPrintData

wxPrintData& GetPrintData()

Returns a reference to the internal print data.

wxPrintPreview::GetPrintout

wxPrintout * GetPrintout()

Gets the preview printout object associated with the wxPrintPreview object.

wxPrintPreview::GetPrintoutForPrinting

wxPrintout * GetPrintoutForPrinting()

Gets the printout object to be used for printing from within the preview interface, or NULL if none exists.

wxPrintPreview::Ok

bool Ok()

Returns TRUE if the wxPrintPreview is valid, FALSE otherwise. It could return FALSE if there was a problem initializing the printer device context (current printer not set, for example).

wxPrintPreview::PaintPage

bool PaintPage(**wxWindow*** *window*)

This refreshes the preview window with the preview image. It must be called from the preview window's OnPaint member.

The implementation simply blits the preview bitmap onto the canvas, creating a new preview bitmap if none exists.

wxPrintPreview::Print

bool Print(**bool** *prompt*)

Invokes the print process using the second wxPrintout object supplied in the wxPrintPreview constructor. Will normally be called by the **Print...** panel item on the preview frame's control bar.

Returns FALSE in case of error -- call *wxPrinter::GetLastError* (p. 809) to get detailed information about the kind of the error.

wxPrintPreview::RenderPage

bool RenderPage(**int** *pageNum*)

Renders a page into a wxMemoryDC. Used internally by wxPrintPreview.

wxPrintPreview::SetCanvas

void SetCanvas(**wxWindow*** *window*)

Sets the window to be used for displaying the print preview image.

wxPrintPreview::SetCurrentPage

void SetCurrentPage(**int** *pageNum*)

Sets the current page to be previewed.

wxPrintPreview::SetFrame

void SetFrame(**wxFrame ***frame*)

Sets the frame to be used for displaying the print preview canvas and control bar.

wxPrintPreview::SetPrintout

void SetPrintout(wxPrintout *printout*)

Associates a printout object with the wxPrintPreview object.

wxPrintPreview::SetZoom

void SetZoom(int *percent*)

Sets the percentage preview zoom, and refreshes the preview canvas accordingly.

wxPrivateDropTarget

wxPrivateDropTarget is for...

Derived from

wxDropTarget (p. 370)

Include files

<wx/dnd.h>

See also

wxDropTarget (p. 370)

wxPrivateDropTarget::wxPrivateDropTarget

wxPrivateDropTarget()

wxPrivateDropTarget::SetId

void SetId(const wxString& *id*)

Yu have to override OnDrop to get at the data. The string ID identifies the format of clipboard or DnD data. A word rocessor would e.g. add a wxTextDataObject and a wxPrivateDataObject to the clipboard - the latter with the Id "WXWORD_FORMAT".

wxPrivateDropTarget::GetId

virtual wxString GetId() **const**

wxProcess

The objects of this class are used in conjunction with *wxExecute* (p. 1279) function. When a wxProcess object is passed to wxExecute(), its *OnTerminate()* (p. 822) virtual method is called when the process terminates. This allows the program to be (asynchronously) notified about the process termination and also retrieve its exit status which is unavailable from wxExecute() in the case of asynchronous execution.

Please note that if the process termination notification is processed by the parent, it is responsible for deleting the wxProcess object which sent it. However, if it is not processed, the object will delete itself and so the library users should only delete those objects whose notifications have been processed (and call *Detach()* (p. 821) for others).

wxProcess also supports IO redirection of the child process. For this, you have to call its *Redirect* (p. 822) method before passing it to *wxExecute* (p. 1279). If the child process was launched successfully, *GetInputStream* (p. 821), *GetOutputStream* (p. 822) and *GetErrorStream* (p. 821) can then be used to retrieve the streams corresponding to the child process stdandard output, input and error output respectively.

Derived from

wxEvtHandler (p. 380)

Include files

<wx/process.h>

See also

wxExecute (p. 1279)
exec sample (p. 1330)

wxProcess::wxProcess

 wxProcess(**wxEvtHandler** * *parent = NULL*, **int** *id = -1*)

Constructs a process object. *id* is only used in the case you want to use wxWindows events. It identifies this object, or another window that will receive the event.

If the *parent* parameter is different from NULL, it will receive a wxEVT_END_PROCESS

notification event (you should insert EVT_END_PROCESS macro in the event table of the parent to handle it) with the given *id.*

Parameters

parent
    The event handler parent.

id
    id of an event.

wxProcess::~wxProcess

~wxProcess()

Destroys the wxProcess object.

wxProcess::CloseOutput

void CloseOutput()

Closes the output stream (the one connected to the stdin of the child process). This function can be used to indicate to the child process that there is no more data to be read - usually, a filter program will only terminate when the input stream is closed.

wxProcess::Detach

void Detach()

Normally, a wxProcess object is deleted by its parent when it receives the notification about the process termination. However, it might happen that the parent object is destroyed before the external process is terminated (e.g. a window from which this external process was launched is closed by the user) and in this case it **should not delete** the wxProcess object, but **should call Detach()** instead. After the wxProcess object is detached from its parent, no notification events will be sent to the parent and the object will delete itself upon reception of the process termination notification.

wxProcess::GetErrorStream

wxInputStream* GetErrorStream() **const**

Returns an input stream which corresponds to the standard error output (stderr) of the child process.

wxProcess::GetInputStream

wxInputStream* GetInputStream() **const**

It returns a output stream corresponding to the standard output stream of the subprocess. If it is NULL, you have not turned on the redirection. See *wxProcess::Redirect* (p. 822).

wxProcess::GetOutputStream

wxOutputStream* GetOutputStream() **const**

It returns an output stream correspoding to the input stream of the subprocess. If it is NULL, you have not turned on the redirection. See *wxProcess::Redirect* (p. 822).

wxProcess::OnTerminate

void OnTerminate(**int** *pid*, **int** *status*) **const**

It is called when the process with the pid *pid* finishes. It raises a wxWindows event when it isn't overridden.

pid
> The pid of the process which has just terminated.

status
> The exit code of the process.

wxProcess::Redirect

void Redirect()

It turns on the redirection, wxExecute will try to open a couple of pipes to catch the subprocess stdio. The caught input stream is returned by GetOutputStream() as a non-seekable stream. The caught output stream is returned by GetInputStream() as a non-seekable stream.

wxProgressDialog

This class represents a dialog that shows a short message and a progress bar. Optionally, it can display an ABORT button.

Derived from

wxFrame (p. 454)

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/progdlg.h>

wxProgressDialog::wxProgressDialog

 wxProgressDialog(**const wxString&** *title*, **const wxString&** *message*, **int** *maximum = 100*, **wxWindow *** *parent = NULL*, **int** *style = wxPD_AUTO_HIDE | wxPD_APP_MODAL*)

Constructor. Creates the dialog, displays it and disables user input for other windows, or, if wxPD_APP_MODAL flag is not given, for its parent window only.

Parameters

title
Dialog title to show in titlebar.

message
Message displayed above the progress bar.

maximum
Maximum value for the progress bar.

parent
Parent window.

message
Message to show on the dialog.

style
The dialog style. This is the combination of the following bitmask constants defined in wx/defs.h:

wxPD_APP_MODAL	Make the progress dialog modal. If this flag is not given, it is only "locally" modal - that is the input to the parent window is disabled, but not to the other ones.
wxPD_AUTO_HIDE	Causes the progress dialog to disappear from screen as soon as the maximum value of the progress meter has been reached.
wxPD_CAN_ABORT	This flag tells the dialog that it should have a "Cancel" button which the user

	may press. If this happens, the next call to *Update()* (p. 824) will return FALSE.
wxPD_ELAPSED_TIME	This flag tells the dialog that it should show elapsed time (since creating the dialog).
wxPD_ESTIMATED_TIME	This flag tells the dialog that it should show estimated time.
wxPD_REMAINING_TIME	This flag tells the dialog that it should show remaining time.

wxProgressDialog::~wxProgressDialog

~wxMessageDialog()

Destructor. Deletes the dialog and enables all top level windows.

wxProgressDialog::Update

bool Update(**int** *value = -1,* **const char** * *newmsg = NULL,*)

Updates the dialog, setting the progress bar to the new value and, if given changes the message above it. Returns TRUE if the ABORT button has *not* been pressed.

If FALSE is returned, the application can either immediately destroy the dialog or ask the user for the confirmation and if the abort is not confirmed the dialog may be resumed with *Resume* (p. 824) function.

value
     The new value of the progress meter. It must be strictly less than the maximum value given to the constructor (i.e., as usual in C, the index runs from 0 to maximum-1).
newmsg
     The new messages for the progress dialog text, if none is given the message is not changed.

wxProgressDialog::Resume

void Resume()

Can be used to continue with the dialog, after the user had chosen ABORT.

wxProcessEvent

A process event is sent when a process is terminated.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/process.h>

Event table macros

To process a wxProcessEvent, use these event handler macros to direct input to a
member function that takes a wxProcessEvent argument.

EVT_END_PROCESS(id, func)	Process a wxEVT_END_PROCESS event. *id* is the identifier of the process object (the id passed to the wxProcess constructor) or a window to receive the event.

See also

wxProcess (p. 820), *Event handling overview* (p. 1372)

wxProcessEvent::wxProcessEvent

 wxProcessEvent(**int** *id = 0*, **int** *pid = 0*)

Constructor. Takes a wxProcessObject or window id, and a process id.

wxProcessEvent::m_pid

int m_pid

Contains the process id.

wxProcessEvent::GetPid

int GetPid() **const**

Returns the process id.

wxProcessEvent::SetPid

void SetPid(**int** *pid*)

Sets the process id.

wxProperty

The **wxProperty** class represents a property, with a *wxPropertyValue* (p. 845) containing the actual value, a name a role, an optional validator, and an optional associated window.

A property might correspond to an actual C++ data member, or it might correspond to a conceptual property, such as the width of a window. There is no explicit data member *wxWindow::width*, but it may be convenient to invent such a property for the purposes of editing attributes of the window. The properties in the property sheet can be mapped to "reality" by whatever means (in this case by calling wxWindow::SetSize when the user has finished editing the property sheet).

A validator may be associated with the property in order to ensure that this and only this validator will be used for editing and validating the property. An alternative method is to use the *role* parameter to specify what kind of validator would be appropriate; for example, specifying "filename" for the role would allow the property view to find an appropriate validator at edit time.

wxProperty::wxProperty

void wxProperty()

void wxProperty(**wxProperty&** *prop*)

void wxProperty(**wxString** *name*, **wxString** *role*, **wxPropertyValidator** *****validator=NULL*)

void wxProperty(**wxString** *name*, **const wxPropertyValue&** *val*, **wxString** *role*, **wxPropertyValidator** *****validator=NULL*)

Constructors.

wxProperty::~wxProperty

void ~wxProperty()

Destructor. Destroys the wxPropertyValue, and the property validator if there is one. However, if the actual C++ value in the wxPropertyValue is a pointer, the data in that variable is not destroyed.

wxProperty::GetValue

wxPropertyValue& GetValue()

Returns a reference to the property value.

wxProperty::GetValidator

wxPropertyValidator * GetValidator()

Returns a pointer to the associated property validator (if any).

wxProperty::GetName

wxString& GetName()

Returns the name of the property.

wxProperty::GetRole

wxRole& GetRole()

Returns the role of the property, to be used when choosing an appropriate validator.

wxProperty::GetWindow

wxWindow * GetWindow()

Returns the window associated with the property (if any).

wxProperty::SetValue

void SetValue(wxPropertyValue& *val*)

Sets the value of the property.

wxProperty::SetName

void SetName (**wxString&** *name*)

Sets the name of the property.

wxProperty::SetRole

void SetRole (**wxString&** *role*)

Sets the role of the property.

wxProperty::SetValidator

void SetValidator(**wxPropertyValidator** **validator*)

Sets the validator: this will be deleted when the property is deleted.

wxProperty::SetWindow

void SetWindow(**wxWindow** **win*)

Sets the window associated with the property.

wxProperty::operator =

void operator =(**const wxPropertyValue&** *val*)

Assignment operator.

wxPropertyFormDialog

The **wxPropertyFormDialog** class is a prepackaged dialog which can be used for viewing a form property sheet. Pass a property form view object, and the dialog will pass OnClose and OnDefaultAction listbox messages to the view class for processing.

wxPropertyFormDialog::wxPropertyFormDialog

void wxPropertyFormDialog(**wxPropertyFormView** **view*, **wxWindow** **parent*, **char** **title*, **bool** *modal=FALSE*, **int** *x=-1*, **int** *y=-1*, **int** *width=-1*, **int** *height=-1*, **long** *style=wxDEFAULT_DIALOG_STYLE*, **char** **name="dialogBox"*)

Constructor.

wxPropertyFormDialog::~wxPropertyFormDialog

void ~wxPropertyFormDialog()

Destructor.

wxPropertyFormFrame

The **wxPropertyFormFrame** class is a prepackaged frame which can be used for viewing a property form. Pass a property form view object, and the frame will pass OnClose messages to the view class for processing.

Call Initialize to create the panel and associate the view; override OnCreatePanel if you wish to use a panel class other than the default wxPropertyFormPanel.

wxPropertyFormFrame::wxPropertyFormFrame

void wxPropertyFormFrame(**wxPropertyFormView** **view*, **wxFrame** **parent*, **char** **title*, **int** *x=-1*, **int** *y=-1*, **int** *width=-1*, **int***height=-1*, **long** *style=wxSDI | wxDEFAULT_FRAME*, **char** **name="frame"*)

Constructor.

wxPropertyFormFrame::~wxPropertyFormFrame

void ~wxPropertyFormFrame()

Destructor.

wxPropertyFormFrame::GetPropertyPanel

wxPanel * **GetPropertyPanel**()

Returns the panel associated with the frame.

wxPropertyFormFrame::Initialize

bool Initialize()

Must be called to create the panel and associate the view with the panel and frame.

wxPropertyFormFrame::OnCreatePanel

wxPanel * OnCreatePanel(**wxFrame** **parent*, **wxPropertyFormView** **view*)

Creates a panel. Override this to create a panel type other than wxPropertyFormPanel.

wxPropertyFormPanel

The **wxPropertyFormPanel** class is a prepackaged panel which can be used for viewing a property form. Pass a property form view object, and the panel will pass OnDefaultAction listbox messages to the view class for processing.

wxPropertyFormPanel::wxPropertyFormPanel

void wxPropertyFormPanel(**wxPropertyFormView** **view*, **wxWindow** **parent*, **int** *x=-1*, **int** *y=-1*, **int** *width=-1*, **int***height=-1*, **long** *style=0*, **char** **name="panel"*)

Constructor.

wxPropertyFormPanel::~wxPropertyFormPanel

void ~wxPropertyFormPanel()

Destructor.

wxPropertyFormValidator

The **wxPropertyFormValidator** class defines a base class for form validators. By overriding virtual functions, the programmer can create custom behaviour for kinds of property.

See also

wxPropertyFormValidator::wxPropertyFormValidator

void wxPropertyFormValidator(**long** *flags = 0*)

Constructor.

wxPropertyFormValidator::~wxPropertyFormValidator

void ~wxPropertyFormValidator()

Destructor.

wxPropertyFormValidator::OnCommand

bool OnCommand(**wxProperty** **property*, **wxPropertyFormView** **view*, **wxWindow** **parentWindow*, **wxCommandEvent&** *event*)

Called when the control corresponding to the property receives a command (if not intercepted by a callback associated with the actual control).

wxPropertyFormValidator::OnCheckValue

bool OnCheckValue(**wxProperty** **property*, **wxPropertyFormView** **view*, **wxWindow** **parentWindow*) Called when the view checks the property value. The value checked by this validator should be taken from the panel item corresponding to the property.

wxPropertyFormValidator::OnDisplayValue

bool OnDisplayValue(**wxProperty** **property*, **wxPropertyFormView** **view*, **wxWindow** **parentWindow*)

Should display the property value in the appropriate control.

wxPropertyFormValidator::OnDoubleClick

bool OnDoubleClick(**wxProperty** **property*, **wxPropertyFormView** **view*, **wxWindow** **parentWindow*)

Called when the control corresponding to the property is double clicked (listboxes only).

wxPropertyFormValidator::OnRetrieveValue

bool OnRetrieveValue(**wxProperty** *property, **wxPropertyFormView** *view, **wxWindow** *parentWindow)

Should do the transfer from the property editing area to the property itself.

wxPropertyFormView

The **wxPropertyFormView** class shows a wxPropertySheet as a view onto a panel or dialog box which has already been created.

See also

wxPropertyFormView overview (p. 1461)

wxPropertyFormView::wxPropertyFormView

void wxPropertyFormView(**long** *flags = 0*)

Constructor.

wxPropertyFormView::~wxPropertyFormView

void ~wxPropertyFormView()

Destructor.

wxPropertyFormView::AssociateNames

void AssociateNames()

Associates the properties with the controls on the panel. For each panel item, if the panel item name is the same as a property name, the two objects will be associated. This function should be called manually since the programmer may wish to do the association manually.

wxPropertyFormView::Check

bool Check()

Checks all properties by calling the appropriate validators; returns FALSE if a validation failed.

wxPropertyFormView::GetPanel

wxPanel * GetPanel()

Returns the panel associated with the view.

wxPropertyFormView::GetManagedWindow

wxWindow * GetManagedWindow()

Returns the managed window (a frame or dialog) associated with the view.

wxPropertyFormView::OnOk

void OnOk()

Virtual function that will be called when the OK button on the physical window is pressed. By default, checks and updates the form values, closes and deletes the frame or dialog, then deletes the view.

wxPropertyFormView::OnCancel

void OnCancel()

Virtual function that will be called when the Cancel button on the physical window is pressed. By default, closes and deletes the frame or dialog, then deletes the view.

wxPropertyFormView::OnHelp

void OnHelp()

Virtual function that will be called when the Help button on the physical window is pressed. This needs to be overridden by the application for anything interesting to happen.

wxPropertyFormView::OnRevert

void OnRevert()

Virtual function that will be called when the Revert button on the physical window is pressed. By default transfers the wxProperty values to the panel items (in effect undoing any unsaved changes in the items).

wxPropertyFormView::OnUpdate

void OnUpdate()

Virtual function that will be called when the Update button on the physical window is pressed. By defaults transfers the displayed values to the wxProperty objects.

wxPropertyFormView::SetManagedWindow

void SetManagedWindow(**wxWindow** **win*)

Sets the managed window (a frame or dialog) associated with the view.

wxPropertyFormView::TransferToDialog

bool TransferToDialog()

Transfers property values to the controls in the dialog.

wxPropertyFormView::TransferToPropertySheet

bool TransferToPropertySheet()

Transfers property values from the controls in the dialog to the property sheet.

wxPropertyListDialog

The **wxPropertyListDialog** class is a prepackaged dialog which can be used for viewing a property list. Pass a property list view object, and the dialog will pass OnClose and OnDefaultAction listbox messages to the view class for processing.

wxPropertyListDialog::wxPropertyListDialog

void wxPropertyListDialog(**wxPropertyListView** **view*, **wxWindow** **parent*, **char** **title*, **bool** *modal=FALSE*, **int** *x=-1*, **int** *y=-1*, **int** *width=-1*, **int** *height=-1*, **long**

style=wxDEFAULT_DIALOG_STYLE, **char** **name="dialogBox"*)

Constructor.

wxPropertyListDialog::~wxPropertyListDialog

void ~wxPropertyListDialog()

Destructor.

wxPropertyListFrame

The **wxPropertyListFrame** class is a prepackaged frame which can be used for viewing a property list. Pass a property list view object, and the frame will pass OnClose messages to the view class for processing.

Call Initialize to create the panel and associate the view; override OnCreatePanel if you wish to use a panel class other than the default wxPropertyListPanel.

wxPropertyListFrame::wxPropertyListFrame

void wxPropertyListFrame(**wxPropertyListView** *view, **wxFrame** *parent, **char** *title, **int** *x=-1*, **int** *y=-1*, **int** *width=-1*, **int***height=-1*, **long** *style=wxSDI | wxDEFAULT_FRAME*, **char** **name="frame"*)

Constructor.

wxPropertyListFrame::~wxPropertyListFrame

void ~wxPropertyListFrame()

Destructor.

wxPropertyListFrame::GetPropertyPanel

wxPanel * GetPropertyPanel()

Returns the panel associated with the frame.

wxPropertyListFrame::Initialize

bool Initialize()

Must be called to create the panel and associate the view with the panel and frame.

wxPropertyListFrame::OnCreatePanel

wxPanel * **OnCreatePanel**(**wxFrame** *parent*, **wxPropertyListView** *view*)

Creates a panel. Override this to create a panel type other than wxPropertyListPanel.

wxPropertyListPanel

The **wxPropertyListPanel** class is a prepackaged panel which can be used for viewing a property list. Pass a property list view object, and the panel will pass OnDefaultAction listbox messages to the view class for processing.

wxPropertyListPanel::wxPropertyListPanel

void wxPropertyListPanel(**wxPropertyListView** *view*, **wxWindow** *parent*, **int** *x=-1*, **int** *y=-1*, **int** *width=-1*, **int***height=-1*, **long** *style=0*, **char** *name="panel"*)

Constructor.

wxPropertyListPanel::~wxPropertyListPanel

void ~wxPropertyListPanel()

Destructor.

wxPropertyListValidator

The **wxPropertyListValidator** abstract class is the base class for deriving validators for property lists.

See also

wxPropertyListValidator::wxPropertyListValidator

void wxPropertyListValidator(**long** *flags = wxPROP_ALLOW_TEXT_EDITING*)

Constructor.

wxPropertyListValidator::~wxPropertyListValidator

void ~wxPropertyListValidator()

Destructor.

wxPropertyListValidator::OnCheckValue

bool OnCheckValue(**wxProperty** **property*, **wxPropertyListView** **view*, **wxWindow** **parentWindow*) Called when the Tick (Confirm) button is pressed or focus is list. Return FALSE if the value was invalid, which is a signal restores the old value. Return TRUE if the value was valid.

wxPropertyListValidator::OnClearControls

bool OnClearControls(**wxProperty** **property*, **wxPropertyListView** **view*, **wxWindow** **parentWindow*) Allows the clearing (enabling, disabling) of property list controls, when the focus leaves the current property.

wxPropertyListValidator::OnClearDetailControls

bool OnClearDetailControls(**wxProperty** **property*, **wxPropertyListView** **view*, **wxWindow** **parentWindow*) Called when the focus is lost, if the validator is in detailed editing mode.

wxPropertyListValidator::OnDisplayValue

bool OnDisplayValue(**wxProperty** **property*, **wxPropertyListView** **view*, **wxWindow** **parentWindow*)

Should display the value in the appropriate controls. The default implementation gets the textual value from the property and inserts it into the text edit control.

wxPropertyListValidator::OnDoubleClick

bool OnDoubleClick(**wxProperty** *property, **wxPropertyListView** *view, **wxWindow** *parentWindow)

Called when the property is double clicked. Extra functionality can be provided, such as cycling through possible values.

wxPropertyListValidator::OnEdit

bool OnEdit(**wxProperty** *property, **wxPropertyListView** *view, **wxWindow** *parentWindow) Called when the Edit (detailed editing) button is pressed. The default implementation calls wxPropertyListView::BeginDetailedEditing; a filename validator (for example) overrides this function to show the file selector.

wxPropertyListValidator::OnPrepareControls

bool OnPrepareControls(**wxProperty** *property, **wxPropertyListView** *view, **wxWindow** *parentWindow)

Called to allow the validator to setup the display, such enabling or disabling buttons, and setting the values and selection in the standard listbox control (the one optionally used for displaying value options).

wxPropertyListValidator::OnPrepareDetailControls

bool OnPrepareDetailControls(**wxProperty** *property, **wxPropertyListView** *view, **wxWindow** *parentWindow) Called when the property is edited 'in detail', i.e. when the Edit button is pressed.

wxPropertyListValidator::OnRetrieveValue

bool OnRetrieveValue(**wxProperty** *property, **wxPropertyListView** *view, **wxWindow** *parentWindow)

Called when Tick (Confirm) is pressed or focus is lost or view wants to update the property list. Should do the transfer from the property editing area to the property itself

wxPropertyListValidator::OnSelect

bool OnSelect(**bool** *select*, **wxProperty** *property, **wxPropertyListView** *view, **wxWindow** *parentWindow)

Called when the property is selected or deselected: typically displays the value in the edit control (having chosen a suitable control to display: (non)editable text or listbox).

wxPropertyListValidator::OnValueListSelect

bool OnValueListSelect(**wxProperty** **property*, **wxPropertyListView** **view*, **wxWindow** **parentWindow*)

Called when the value listbox is selected. The default behaviour is to copy string to text control, and retrieve the value into the property.

wxPropertyListView

The **wxPropertyListView** class shows a wxPropertySheet as a Visual Basic-style property list.

See also

wxPropertyListView overview (p. 1461)

wxPropertyListView::wxPropertyListView

void wxPropertyListView(**long** *flags = wxPROP_BUTTON_DEFAULT*)

Constructor.

The *flags* argument can be a bit list of the following:

- wxPROP_BUTTON_CLOSE
- wxPROP_BUTTON_OK
- wxPROP_BUTTON_CANCEL
- wxPROP_BUTTON_CHECK_CROSS
- wxPROP_BUTTON_HELP
- wxPROP_DYNAMIC_VALUE_FIELD
- wxPROP_PULLDOWN

wxPropertyListView::~wxPropertyListView

void ~wxPropertyListView()

Destructor.

wxPropertyListView::AssociatePanel

void AssociatePanel(wxPanel *panel)

Associates the window on which the controls will be displayed, with the view (sets an internal pointer to the window).

wxPropertyListView::BeginShowingProperty

bool BeginShowingProperty(wxProperty *property)

Finds the appropriate validator and loads the property into the controls, by calling wxPropertyValidator::OnPrepareControls and then wxPropertyListView::DisplayProperty.

wxPropertyListView::DisplayProperty

bool DisplayProperty(wxProperty *property)

Calls wxPropertyValidator::OnDisplayValue for the current property's validator. This function gets called by wxPropertyListView::BeginShowingProperty, which is in turn called from ShowProperty, called by OnPropertySelect, called by the listbox callback when selected.

wxPropertyListView::EndShowingProperty

bool EndShowingProperty(wxProperty *property)

Finds the appropriate validator and unloads the property from the controls, by calling wxPropertyListView::RetrieveProperty, wxPropertyValidator::OnClearControls and (if we're in detailed editing mdoe) wxPropertyValidator::OnClearDetailControls.

wxPropertyListView::GetPanel

wxPanel * GetPanel()

Returns the panel associated with the view.

wxPropertyListView::GetManagedWindow

wxWindow * GetManagedWindow()

Returns the managed window (a frame or dialog) associated with the view.

wxPropertyListView::GetWindowCancelButton

wxButton * GetWindowCancelButton()

Returns the window cancel button, if any.

wxPropertyListView::GetWindowCloseButton

wxButton * GetWindowCloseButton()

Returns the window close or OK button, if any.

wxPropertyListView::GetWindowHelpButton

wxButton * GetWindowHelpButton()

Returns the window help button, if any.

wxPropertyListView::SetManagedWindow

void SetManagedWindow(**wxWindow *** *win*)

Sets the managed window (a frame or dialog) associated with the view.

wxPropertyListView::UpdatePropertyDisplayInList

bool UpdatePropertyDisplayInList(**wxProperty ***property*)

Updates the display for the given changed property.

wxPropertyListView::UpdatePropertyList

bool UpdatePropertyList(**bool** *clearEditArea = TRUE*)

Updates the whole property list display.

wxPropertySheet

The **wxPropertySheet** class is used for storing a number of wxProperty objects (essentially names and values).

See also

wxPropertySheet overview(p. 1462)

wxPropertySheet::wxPropertySheet

void wxPropertySheet(**const wxString** *name = ""*)

Constructor. Sets property sheet's name to name if present.

wxPropertySheet::~wxPropertySheet

void ~wxPropertySheet()

Destructor. Destroys all contained properties.

wxPropertySheet::AddProperty

void AddProperty(**wxProperty** **property*)

Adds a property to the sheet.

wxPropertySheet::Clear

void Clear()

Clears all the properties from the sheet (deleting them).

wxPropertySheet::GetName

wxString GetName()

Gets the sheet's name.

wxPropertySheet::GetProperty

wxProperty * GetProperty(**wxString** *name*)

Gets a property by name.

wxPropertySheet::GetProperties

wxList& GetProperties()

Returns a reference to the internal list of properties.

wxPropertySheet::HasProperty

bool HasProperty(**wxString** *propname*)

Returns true if sheet contains property propname.

wxPropertySheet::RemoveProperty

void RemoveProperty(**wxString** *propname*)

Removes property propname from sheet, deleting it.

wxPropertySheet::SetName

void SetName(**wxString** *sheetname*)

Set the sheet's name to sheetname

wxPropertySheet::SetProperty

bool SetProperty(**wxString** *propname*, **wxPropertyValue** *value*)

Sets property propname to value. Returns false if property is not a member of sheet.

wxPropertySheet::SetAllModified

void SetAllModified(**bool** *flag*)

Sets the 'modified' flag of each property value.

wxPropertyValidator

The **wxPropertyValidator** abstract class is the base class for deriving validators for properties.

See also

wxPropertyValidator overview (p. 1460)

wxPropertyValidator::wxPropertyValidator

void wxPropertyValidator(**long** *flags = 0*)

Constructor.

wxPropertyValidator::~wxPropertyValidator

void ~wxPropertyValidator()

Destructor.

wxPropertyValidator::GetFlags

long GetFlags()

Returns the flags for the validator.

wxPropertyValidator::GetValidatorProperty

wxProperty * GetValidatorProperty()

Gets the property for the validator.

wxPropertyValidator::SetValidatorProperty

void SetValidatorProperty(**wxProperty** **property*)

Sets the property for the validator.

wxPropertyValidatorRegistry

The **wxPropertyValidatorRegistry** class is used for storing validators, indexed by the 'role name' of the property, by which groups of property can be identified for the purpose of validation and editing.

wxPropertyValidatorRegistry::wxPropertyValidatorRegistry

void wxPropertyValidatorRegistry()

Constructor.

wxPropertyValidatorRegistry::~wxPropertyValidatorRegistry

void ~wxPropertyValidatorRegistry()

Destructor.

wxPropertyValidatorRegistry::Clear

void ClearRegistry()

Clears the registry, deleting the validators.

wxPropertyValidatorRegistry::GetValidator

wxPropertyValidator * GetValidator(**wxString&** *roleName*)

Retrieve a validator by the property role name.

wxPropertyValidatorRegistry::RegisterValidator

void RegisterValidator(**wxString&** *roleName*, **wxPropertyValidator ****validator*)

Register a validator with the registry. *roleName* is a name indicating the role of the property, such as "filename". Later, when a validator is chosen for editing a property, this role name is matched against the class names of the property, if the property does not already have a validator explicitly associated with it.

wxPropertyValue

The **wxPropertyValue** class represents the value of a property, and is normally associated with a wxProperty object.

A wxPropertyValue has one of the following types:

- wxPropertyValueNull
- wxPropertyValueInteger
- wxPropertyValueReal
- wxPropertyValueBool
- wxPropertyValueString
- wxPropertyValueList
- wxPropertyValueIntegerPtr
- wxPropertyValueRealPtr
- wxPropertyValueBoolPtr
- wxPropertyValueStringPtr

wxPropertyValue::wxPropertyValue

void wxPropertyValue()

Default constructor.

void wxPropertyValue(**const wxPropertyValue&** *copyFrom*)

Copy constructor.

void wxPropertyValue(**char** *val)

Construction from a string value.

void wxPropertyValue(**long** *val*)

Construction from an integer value. You may need to cast to (long) to avoid confusion with other constructors (such as the bool constructor).

void wxPropertyValue(**bool** *val*)

Construction from a boolean value.

void wxPropertyValue(**float** *val*)

Construction from a floating point value.

void wxPropertyValue(**double** *val*)

Construction from a floating point value.

void wxPropertyValue(**wxList** * *val*)

Construction from a list of wxPropertyValue objects. The list, but not each contained wxPropertyValue, will be deleted by the constructor. The wxPropertyValues will be

assigned to this wxPropertyValue list. In other words, so do not delete wxList or its data after calling this constructor.

void wxPropertyValue(**wxStringList** * *val*)

Construction from a list of strings. The list (including the strings contained in it) will be deleted by the constructor, so do not destroy *val* explicitly.

void wxPropertyValue(**char *****val*)

Construction from a string pointer.

void wxPropertyValue(**long** *val)

Construction from an integer pointer.

void wxPropertyValue(**bool** *val)

Construction from an boolean pointer.

void wxPropertyValue(**float** *val)

Construction from a floating point pointer.

The last four constructors use pointers to various C++ types, and do not store the types themselves; this allows the values to stand in for actual data values defined elsewhere.

wxPropertyValue::~wxPropertyValue

void ~wxPropertyValue()

Destructor.

wxPropertyValue::Append

void Append(**wxPropertyValue** *expr)

Appends a property value to the list.

wxPropertyValue::BoolValue

bool BoolValue()

Returns the boolean value.

wxPropertyValue::BoolValuePtr

bool * BoolValuePtr()

Returns the pointer to the boolean value.

wxPropertyValue::ClearList

void ClearList()

Deletes the contents of the list.

wxPropertyValue::Delete

void Delete(**wxPropertyValue** *expr)

Deletes *expr* from this list.

wxPropertyValue::GetFirst

wxPropertyValue * GetFirst()

Gets the first value in the list.

wxPropertyValue::GetLast

wxPropertyValue * GetFirst()

Gets the last value in the list.

wxPropertyValue::GetModified

bool GetModified()

Returns TRUE if the value was modified since being created (or since SetModified was called).

wxPropertyValue::GetNext

wxPropertyValue * GetNext()

Gets the next value in the list (the one after 'this').

wxPropertyValue::GetStringRepresentation

wxString GetStringRepresentation()

Gets a string representation of the value.

wxPropertyValue::IntegerValue

long IntegerValue()

Returns the integer value.

wxPropertyValue::Insert

void Insert(**wxPropertyValue ****expr*)

Inserts a property value at the front of a list.

wxPropertyValue::IntegerValuePtr

long * IntegerValuePtr()

Returns the pointer to the integer value.

wxPropertyValue::Nth

wxPropertyValue * Nth(**int** *n*)

Returns the nth value of a list expression (starting from zero).

wxPropertyValue::Number

int Number()

Returns the number of elements in a list expression.

wxPropertyValue::RealValue

float RealValue()

Returns the floating point value.

wxPropertyValue::RealValuePtr

float * RealValuePtr()

Returns the pointer to the floating point value.

wxPropertyValue::SetModified

void SetModified(**bool** *flag*)

Sets the 'modified' flag.

wxPropertyValue::StringValue

char * StringValue()

Returns the string value.

wxPropertyValue::StringValuePtr

char ** StringValuePtr()

Returns the pointer to the string value.

wxPropertyValue::Type

wxPropertyValueType Type()

Returns the value type.

wxPropertyValue::operator =

void operator =(**const wxPropertyValue&** *val*)

void operator =(**const char** **val*)

void operator =(**const long** *val*)

void operator =(**const bool** *val*)

void operator =(**const float** *val*)

void operator =(**const char** ***val*)

void operator =(**const long** *val)

void operator =(**const bool** *val)

void operator =(**const float** *val)

Assignment operators.

wxPropertyView

The **wxPropertyView** abstract class is the base class for views of property sheets, acting as intermediaries between properties and actual windows.

See also

wxPropertyView overview (p. 1461)

wxPropertyView::wxPropertyView

void wxPropertyView(**long** *flags = wxPROP_BUTTON_DEFAULT*)

Constructor.

The *flags* argument can be a bit list of the following:

- wxPROP_BUTTON_CLOSE
- wxPROP_BUTTON_OK
- wxPROP_BUTTON_CANCEL
- wxPROP_BUTTON_CHECK_CROSS
- wxPROP_BUTTON_HELP
- wxPROP_DYNAMIC_VALUE_FIELD
- wxPROP_PULLDOWN

wxPropertyView::~wxPropertyView

void ~wxPropertyView()

Destructor.

wxPropertyView::AddRegistry

void AddRegistry(wxPropertyValidatorRegistry *registry***)**

Adds a registry (list of property validators) the view's list of registries, which is initially empty.

wxPropertyView::FindPropertyValidator

wxPropertyValidator * FindPropertyValidator(**wxProperty** *property*)

Finds the property validator that is most appropriate to this property.

wxPropertyView::GetPropertySheet

wxPropertySheet * GetPropertySheet()

Gets the property sheet for this view.

wxPropertyView::GetRegistryList

wxList& GetRegistryList()

Returns a reference to the list of property validator registries.

wxPropertyView::OnOk

void OnOk()

Virtual function that will be called when the OK button on the physical window is pressed (if it exists).

wxPropertyView::OnCancel

void OnCancel()

Virtual function that will be called when the Cancel button on the physical window is pressed (if it exists).

wxPropertyView::OnClose

bool OnClose()

Virtual function that will be called when the physical window is closed. The default implementation returns FALSE.

wxPropertyView::OnHelp

void OnHelp()

Virtual function that will be called when the Help button on the physical window is pressed (if it exists).

wxPropertyView::OnPropertyChanged

void OnPropertyChanged(**wxProperty** **property*)

Virtual function called by a view or validator when a property's value changed. Validators must be written correctly for this to be called. You can override this function to respond immediately to property value changes.

wxPropertyView::OnUpdateView

bool OnUpdateView()

Called by the viewed object to update the view. The default implementation just returns FALSE.

wxPropertyView::SetPropertySheet

void SetPropertySheet(**wxPropertySheet** **sheet*)

Sets the property sheet for this view.

wxPropertyView::ShowView

void ShowView(**wxPropertySheet** **sheet*, **wxPanel** **panel*)

Associates this view with the given panel, and shows the view.

wxProtocol

Derived from

wxSocketClient (p. 960)

Include files

<wx/protocol/protocol.h>

See also

wxSocketBase (p. 943), *wxURL* (p. 1169)

wxProtocol::Reconnect

bool Reconnect()

Tries to reestablish a previous opened connection (close and renegotiate connection).

Return value

TRUE, if the connection is established, else FALSE.

wxProtocol::GetInputStream

wxInputStream * GetInputStream(const wxString& *path*)

Creates a new input stream on the the specified path. You can use all but seek functionnality of wxStream. Seek isn't available on all stream. For example, http or ftp streams doesn't deal with it. Other functions like StreamSize and Tell aren't available for the moment for this sort of stream. You will be notified when the EOF is reached by an error.

Return value

Returns the initialized stream. You will have to delete it yourself once you don't use it anymore. The destructor closes the network connection.

See also

wxInputStream (p. 595)

wxProtocol::Abort

bool Abort()

Abort the current stream.

Warning

It is advised to destroy the input stream instead of aborting the stream this way.

Return value

Returns TRUE, if successful, else FALSE.

wxProtocol::GetError

wxProtocolError GetError()

Returns the last occurred error.

wxPROTO_NOERR	No error.
wxPROTO_NETERR	A generic network error occurred.
wxPROTO_PROTERR	An error occurred during negotiation.
wxPROTO_CONNERR	The client failed to connect the server.
wxPROTO_INVVAL	Invalid value.
wxPROTO_NOHNDLR	.
wxPROTO_NOFILE	The remote file doesn't exist.
wxPROTO_ABRT	Last action aborted.
wxPROTO_RCNCT	An error occurred during reconnection.
wxPROTO_STREAM	Someone tried to send a command during a transfer.

wxProtocol::GetContentType

wxString GetContentType()

Returns the type of the content of the last opened stream. It is a mime-type.

wxProtocol::SetUser

void SetUser(**const wxString&** *user*)

Sets the authentication user. It is mainly useful when FTP is used.

wxProtocol::SetPassword

void SetPassword(**const wxString&** *user*)

Sets the authentication password. It is mainly useful when FTP is used.

wxQueryCol

Every ODBC data column is represented by an instance of this class.

Derived from

wxObject (p. 750)

Include files

<wx/odbc.h>

See also

wxQueryCol overview (p. 1435), *wxDatabase overview* (p. 1434)

wxQueryCol::wxQueryCol

void wxQueryCol()

Constructor. Sets the attributes of the column to default values.

wxQueryCol::~wxQueryCol

void ~wxQueryCol()

Destructor. Deletes the wxQueryField list.

wxQueryCol::BindVar

void * BindVar(**void ****v*, **long** *sz*)

Binds a user-defined variable to a column. Whenever a column is bound to a variable, it will automatically copy the data of the current field into this buffer (to a maximum of *sz* bytes).

wxQueryCol::FillVar

void FillVar(**int** *recnum*)

Fills the bound variable with the data of the field recnum. When no variable is bound to the column nothing will happen.

wxQueryCol::GetData

void * GetData(**int** *field*)

Returns a pointer to the data of the field.

wxQueryCol::GetName

wxString GetName()

Returns the name of a column.

wxQueryCol::GetType

short GetType()

Returns the data type of a column.

wxQueryCol::GetSize

long GetSize(**int** *field*)

Return the size of the data of the field field.

wxQueryCol::IsRowDirty

bool IsRowDirty(**int** *field*)

Returns TRUE if the given field has been changed, but not saved.

wxQueryCol::IsNullable

bool IsNullable()

Returns TRUE if a column may contain no data.

wxQueryCol::AppendField

void AppendField(**void** **buf*, **long** *len*)

Appends a wxQueryField instance to the field list of the column. *len* bytes from *buf* will
be copied into the field's buffer.

wxQueryCol::SetData

bool SetData(**int** *field*, **void** *buf, **long** *len*)

Sets the data of a field. This function finds the wxQueryField corresponding to *field* and calls wxQueryField::SetData with *buf* and *len* arguments.

wxQueryCol::SetName

void SetName(**const wxString&** *name*)

Sets the name of a column. Only useful when creating new tables or appending columns.

wxQueryCol::SetNullable

void SetNullable(**bool** *nullable*)

Determines whether a column may contain no data. Only useful when creating new tables or appending columns.

wxQueryCol::SetFieldDirty

void SetFieldDirty(**int** *field*, **bool** *dirty = TRUE*)

Sets the dirty tag of a given field.

wxQueryCol::SetType

void SetType(**short** *type*)   Sets the data type of a column. Only useful when creating new tables or appending columns.

wxQueryField

Represents the data item for one or several columns.

Derivation

wxObject (p. 750)

See also

wxQueryField overview (p. 1435), *wxDatabase overview* (p. 1434)

wxQueryField::wxQueryField

wxQueryField()

Constructor. Sets type and size of the field to default values.

wxQueryField::~wxQueryField

~wxQueryField()

Destructor. Frees the associated memory depending on the field type.

wxQueryField::AllocData

bool AllocData()

Allocates memory depending on the size and type of the field.

wxQueryField::ClearData

void ClearData()

Deletes the contents of the field buffer without deallocating the memory.

wxQueryField::GetData

void * GetData()

Returns a pointer to the field buffer.

wxQueryField::GetSize

long GetSize()

Returns the size of the field buffer.

wxQueryField::GetType

short GetType()

Returns the type of the field (currently SQL_CHAR, SQL_VARCHAR or
SQL_INTEGER).

wxQueryField::IsDirty

bool IsDirty()

Returns TRUE if the data of a field has been changed, but not saved.

wxQueryField::SetData

bool SetData(**void** **data*, **long** *sz*)

Allocates memory of the size *sz* and copies the contents of *d* into the field buffer.

wxQueryField::SetDirty

void SetDirty(**bool** *dirty = TRUE*)

Sets the dirty tag of a field.

wxQueryField::SetSize

void SetSize(**long** *size*)

Resizes the field buffer. Stored data will be lost.

wxQueryField::SetType

void SetType(**short** *type*)

Sets the type of the field. Currently the types SQL_CHAR, SQL_VARCHAR and SQL_INTEGER are supported.

wxQueryLayoutInfoEvent

This event is sent when *wxLayoutAlgorithm* (p. 614) wishes to get the size, orientation and alignment of a window. More precisely, the event is sent by the OnCalculateLayout handler which is itself invoked by wxLayoutAlgorithm.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/laywin.h>

Event table macros

EVT_QUERY_LAYOUT_INFO(func)   Process a wxEVT_QUERY_LAYOUT_INFO event, to get size, orientation and alignment from a window.

Data structures

```
enum wxLayoutOrientation {
    wxLAYOUT_HORIZONTAL,
    wxLAYOUT_VERTICAL
};

enum wxLayoutAlignment {
    wxLAYOUT_NONE,
    wxLAYOUT_TOP,
    wxLAYOUT_LEFT,
    wxLAYOUT_RIGHT,
    wxLAYOUT_BOTTOM,
};
```

See also

wxCalculateLayoutEvent (p. 94), *wxSashLayoutWindow* (p. 898), *wxLayoutAlgorithm* (p. 614).

wxQueryLayoutInfoEvent::wxQueryLayoutInfoEvent

wxQueryLayoutInfoEvent(**wxWindowID** *id = 0*)

Constructor.

wxQueryLayoutInfoEvent::GetAlignment

void GetAlignment() **const**

Specifies the alignment of the window (which side of the remaining parent client area the window sticks to). One of wxLAYOUT_TOP, wxLAYOUT_LEFT, wxLAYOUT_RIGHT, wxLAYOUT_BOTTOM.

wxQueryLayoutInfoEvent::GetFlags

int GetFlags() **const**

Returns the flags associated with this event. Not currently used.

wxQueryLayoutInfoEvent::GetOrientation

wxLayoutOrientation GetOrientation() const

Returns the orientation that the event handler specified to the event object. May be one of wxLAYOUT_HORIZONTAL, wxLAYOUT_VERTICAL.

wxQueryLayoutInfoEvent::GetRequestedLength

int GetRequestedLength() const

Returns the requested length of the window in the direction of the window orientation. This information is not yet used.

wxQueryLayoutInfoEvent::GetSize

wxSize GetSize() const

Returns the size that the event handler specified to the event object as being the requested size of the window.

wxQueryLayoutInfoEvent::SetAlignment

void SetAlignment(wxLayoutAlignment *alignment*)

Call this to specify the alignment of the window (which side of the remaining parent client area the window sticks to). May be one of wxLAYOUT_TOP, wxLAYOUT_LEFT, wxLAYOUT_RIGHT, wxLAYOUT_BOTTOM.

wxQueryLayoutInfoEvent::SetFlags

void SetFlags(int *flags*)

Sets the flags associated with this event. Not currently used.

wxQueryLayoutInfoEvent::SetOrientation

void SetOrientation(wxLayoutOrientation *orientation*)

Call this to specify the orientation of the window. May be one of wxLAYOUT_HORIZONTAL, wxLAYOUT_VERTICAL.

wxQueryLayoutInfoEvent::SetRequestedLength

void SetRequestedLength(**int** *length*)

Sets the requested length of the window in the direction of the window orientation. This information is not yet used.

wxQueryLayoutInfoEvent::SetSize

void SetSize(**const wxSize&** *size*)

Call this to let the calling code know what the size of the window is.

wxRadioBox

A radio box item is used to select one of number of mutually exclusive choices. It is displayed as a vertical column or horizontal row of labelled buttons.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/radiobox.h>

Window styles

wxRA_SPECIFY_ROWS	The major dimension parameter refers to the maximum number of rows.
wxRA_SPECIFY_COLS	The major dimension parameter refers to the maximum number of columns.

See also *window styles overview* (p. 1379).

Event handling

EVT_RADIOBOX(id, func)	Process a wxEVT_COMMAND_RADIOBOX_SELECTED event, when a radiobutton is clicked.

See also

Event handling overview(p. 1372), *wxRadioButton* (p. 869), *wxCheckBox* (p. 108)

wxRadioBox::wxRadioBox

wxRadioBox()

Default constructor.

wxRadioBox(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *point = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **int** *n = 0*, **const wxString** *choices[] = NULL*, **int** *majorDimension = 0*, **long** *style = wxRA_SPECIFY_COLS*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "radioBox"*)

Constructor, creating and showing a radiobox.

Parameters

parent
Parent window. Must not be NULL.

id
Window identifier. A value of -1 indicates a default value.

label
Label for the static box surrounding the radio buttons.

pos
Window position. If the position (-1, -1) is specified then a default position is chosen.

size
Window size. If the default size (-1, -1) is specified then a default size is chosen.

n
Number of choices with which to initialize the radiobox.

choices
An array of choices with which to initialize the radiobox.

majorDimension
Specifies the maximum number of rows (if style contains wxRA_SPECIFY_ROWS) or columns (if style contains wxRA_SPECIFY_COLS) for a two-dimensional radiobox.

style
    Window style. See *wxRadioBox* (p. 863).

validator
    Window validator.

name
    Window name.

See also

wxRadioBox::Create (p. 865), *wxValidator* (p. 1172)

wxPython note: The wxRadioBox constructor in wxPython reduces the `n` and `choices` arguments are to a single argument, which is a list of strings.

wxRadioBox::~wxRadioBox

~wxRadioBox()

Destructor, destroying the radiobox item.

wxRadioBox::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *point = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **int** *n = 0*, **const wxString** *choices[] = NULL*, **int** *majorDimension = 0*, **long** *style = wxRA_SPECIFY_COLS*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "radioBox"*)

Creates the radiobox for two-step construction. See *wxRadioBox::wxRadioBox* (p. 864) for further details.

wxRadioBox::Enable

void Enable(**const bool** *enable*)

Enables or disables the entire radiobox.

void Enable(**int** *n*, **const bool** *enable*)

Enables or disables an individual button in the radiobox.

Parameters

enable
    TRUE to enable, FALSE to disable.

n
    The zero-based button to enable or disable.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

Enable(flag)	Enables or disables the entire radiobox.
EnableItem(n, flag)	Enables or disables an individual button in the radiobox.

wxRadioBox::FindString

int FindString(**const wxString&** *string*) **const**

Finds a button matching the given string, returning the position if found, or -1 if not found.

Parameters

string
    The string to find.

wxRadioBox::GetLabel

wxString GetLabel() **const**

Returns the radiobox label.

wxString GetLabel(**int** *n*) **const**

Returns the label for the given button.

Parameters

n
    The zero-based button index.

See also

wxRadioBox::SetLabel (p. 867)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

GetLabel()	Returns the radiobox label.

GetItemLabel(n)	Returns the label for the given button.

wxRadioBox::GetSelection

int GetSelection() **const**

Returns the zero-based position of the selected button.

wxRadioBox::GetStringSelection

wxString GetStringSelection() **const**

Returns the selected string.

wxRadioBox::Number

int Number() **const**

Returns the number of buttons in the radiobox.

wxRadioBox::SetLabel

void SetLabel(**const wxString&** *label*)

Sets the radiobox label.

void SetLabel(**int** *n*, **const wxString&** *label*)

Sets a label for a radio button.

Parameters

label
    The label to set.

n
    The zero-based button index.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

SetLabel(string)	Sets the radiobox label.
SetItemLabel(n, string)	Sets a label for a radio button.

wxRadioBox::SetSelection

void SetSelection(**int** *n*)

Sets a button by passing the desired string position. This does not cause a wxEVT_COMMAND_RADIOBOX_SELECTED event to get emitted.

Parameters

n
     The zero-based button position.

wxRadioBox::SetStringSelection

void SetStringSelection(**const wxString&** *string*)

Sets the selection to a button by passing the desired string. This does not cause a wxEVT_COMMAND_RADIOBOX_SELECTED event to get emitted.

Parameters

string
     The label of the button to select.

wxRadioBox::Show

void Show(**const bool** *show*)

Shows or hides the entire radiobox.

void Show(**int** *item*, **const bool** *show*)

Shows or hides individual buttons.

Parameters

show
     TRUE to show, FALSE to hide.

item
     The zero-based position of the button to show or hide.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

Show(flag)	Shows or hides the entire radiobox.

ShowItem(n, flag)	Shows or hides individual buttons.

wxRadioBox::GetString

wxString GetString(**int** *n*) **const**

Returns the label for the button at the given position.

Parameters

n
  The zero-based button position.

wxRadioButton

A radio button item is a button which usually denotes one of several mutually exclusive options. It has a text label next to a (usually) round button.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/radiobut.h>

Window styles

wxRB_GROUP   Marks the beginning of a new group of radio buttons.

See also *window styles overview* (p. 1379).

Event handling

EVT_RADIOBUTTON(id, func)	Process a wxEVT_COMMAND_RADIOBUTTON_SELEC TED event, when the radiobutton is clicked.

See also

Event handling overview(p. 1372), *wxRadioBox* (p. 863), *wxCheckBox* (p. 108)

wxRadioButton::wxRadioButton

wxRadioButton()

Default constructor.

wxRadioButton(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *0*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"radioButton"*)

Constructor, creating and showing a radio button.

Parameters

parent
Parent window. Must not be NULL.

id
Window identifier. A value of -1 indicates a default value.

label
Label for the radio button.

pos
Window position. If the position (-1, -1) is specified then a default position is chosen.

size
Window size. If the default size (-1, -1) is specified then a default size is chosen.

style
Window style. See *wxRadioButton* (p. 869).

validator
Window validator.

name
Window name.

See also

wxRadioButton::Create (p. 871), *wxValidator* (p. 1172)

wxRadioButton::~wxRadioButton

void ~wxRadioButton()

Destructor, destroying the radio button item.

wxRadioButton::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *0*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"radioButton"*)

Creates the choice for two-step construction. See *wxRadioButton::wxRadioButton* (p. 870) for further details.

wxRadioButton::GetValue

bool GetValue() **const**

Returns TRUE if the radio button is depressed, FALSE otherwise.

wxRadioButton::SetValue

void SetValue(**const bool** *value*)

Sets the radio button to selected or deselected status. This does not cause a wxEVT_COMMAND_RADIOBUTTON_SELECTED event to get emitted.

Parameters

value
    TRUE to select, FALSE to deselect.

wxRealFormValidator

This class validates a range of real values for form views. The associated panel item must be a wxText.

See also

Validator classes (p. 1463)

wxRealFormValidator::wxRealFormValidator

void wxRealFormValidator(**float** *min=0.0*, **float** *max=0.0*, **long** *flags=0*)

Constructor. Assigning zero to minimum and maximum values indicates that there is no range to check.

wxRealListValidator

This class validates a range of real values for property lists.

See also

Validator classes (p. 1463)

wxPropertySheet overview(p. 1462)

wxRealListValidator::wxRealListValidator

void wxRealListValidator(**float** *min=0.0*, **float** *max=0.0*, **long** *flags=wxPROP_ALLOW_TEXT_EDITING*)

Constructor. Assigning zero to minimum and maximum values indicates that there is no range to check.

wxRealPoint

A **wxRealPoint** is a useful data structure for graphics operations. It contains floating point point *x* and *y* members. See also *wxPoint* (p. 790) for an integer version.

Derived from

None

Include files

<wx/gdicmn.h>

See also

wxPoint (p. 790)

wxRealPoint::wxRealPoint

wxRealPoint()

wxRealPoint(**double** *x*, **double** *y*)

Create a point.

double x

double y

Members of the **wxRealPoint** object.

wxRect

A class for manipulating rectangles.

Derived from

None

Include files

<wx/gdicmn.h>

See also

wxPoint (p. 790), *wxSize* (p. 926)

wxRect::wxRect

wxRect()

Default constructor.

wxRect(**int** *x*, **int** *y*, **int** *width*, **int** *height*)

Creates a wxRect object from x, y, width and height values.

wxRect(**const wxPoint&** *topLeft*, **const wxPoint&** *bottomRight*)

Creates a wxRect object from top-left and bottom-right points.

wxRect(**const wxPoint&** *pos*, **const wxSize&** *size*)

Creates a wxRect object from position and size values.

wxRect::x

int x

x coordinate of the top-level corner of the rectangle.

wxRect::y

int y

y coordinate of the top-level corner of the rectangle.

wxRect::width

int width

Width member.

wxRect::height

int height

Height member.

wxRect::GetBottom

int GetBottom() **const**

Gets the bottom point of the rectangle.

wxRect::GetHeight

int GetHeight() const

Gets the height member.

wxRect::GetLeft

int GetLeft() const

Gets the left point of the rectangle (the same as *wxRect::GetX* (p. 875)).

wxRect::GetPosition

wxPoint GetPosition() const

Gets the position.

wxRect::GetRight

int GetRight() const

Gets the right point of the rectangle.

wxRect::GetSize

wxSize GetSize() const

Gets the size.

wxRect::GetTop

int GetTop() const

Gets the top point of the rectangle (the same as *wxRect::GetY* (p. 876)).

wxRect::GetWidth

int GetWidth() const

Gets the width member.

wxRect::GetX

int GetX() **const**

Gets the x member.

wxRect::GetY

int GetY() **const**

Gets the y member.

wxRect::Inflate

void Inflate(**wxCoord** *dx*, **wxCoord** *dy*)

void Inflate(**wxCoord** *diff*)

Increase the rectangle size by *dx* in x direction and *dy* in y direction. Both (or one of) parameters may be negative to decrease the rectngle size.

The second form uses the same *diff* for both *dx* and *dy*.

wxRect::SetHeight

void SetHeight(**int** *height*)

Sets the height.

wxRect::SetWidth

void SetWidth(**int** *width*)

Sets the width.

wxRect::SetX

void SetX(**int** *x*)

Sets the x position.

wxRect::SetY

void SetY(**int** *y*)

Sets the y position.

wxRect::operator =

void operator =(**const wxRect&** *rect*)

Assignment operator.

wxRect::operator ==

bool operator ==(**const wxRect&** *rect*)

Equality operator.

wxRect::operator !=

bool operator !=(**const wxRect&** *rect*)

Inequality operator.

wxRecordSet

Each wxRecordSet represents an ODBC database query. You can make multiple queries at a time by using multiple wxRecordSets with a wxDatabase or you can make your queries in sequential order using the same wxRecordSet.

Note: this class is considered obsolete, replaced by the Remstar wxDB/wxTable classes (documented separately in Word and PDF format, as odbc.doc and odbc.pdf).

Derived from

wxObject (p. 750)

Include files

<wx/odbc.h>

See also

wxRecordSet overview (p. 1435), *wxDatabase overview* (p. 1434)

wxRecordSet::wxRecordSet

wxRecordSet(**wxDatabase** *db, **int** *type* = *wxOPEN_TYPE_DYNASET*, **int** *opt* = *wxOPTION_DEFAULT*)

Constructor. *db* is a pointer to the wxDatabase instance you wish to use the wxRecordSet with. Currently there are two possible values of *type*:

- wxOPEN_TYPE_DYNASET: Loads only one record at a time into memory. The other data of the result set will be loaded dynamically when moving the cursor. This is the default type.
- wxOPEN_TYPE_SNAPSHOT: Loads all records of a result set at once. This will need much more memory, but will result in faster access to the ODBC data.

The *option* parameter is not used yet.

The constructor appends the wxRecordSet object to the parent database's list of wxRecordSet objects, for later destruction when the wxDatabase is destroyed.

wxRecordSet::~wxRecordSet

~wxRecordSet()

Destructor. All data except that stored in user-defined variables will be lost. It also unlinks the wxRecordSet object from the parent database's list of wxRecordSet objects.

wxRecordSet::AddNew

void AddNew()

Not implemented.

wxRecordSet::BeginQuery

bool BeginQuery(**int** *openType*, **const wxString&** *sql* = *NULL*, **int** *options* = *wxOPTION_DEFAULT*)

Not implemented.

wxRecordSet::BindVar

void * **BindVar**(**int** *col*, **void** *buf, **long** *size*)

Binds a user-defined variable to the column col. Whenever the current field's data changes, it will be copied into buf (maximum *size* bytes).

void * **BindVar**(**const wxString&** *col*, **void** *buf, **long** *size*)

The same as above, but uses the column name as the identifier.

wxRecordSet::CanAppend

bool CanAppend()

Not implemented.

wxRecordSet::Cancel

void Cancel()

Not implemented.

wxRecordSet::CanRestart

bool CanRestart()

Not implemented.

wxRecordSet::CanScroll

bool CanScroll()

Not implemented.

wxRecordSet::CanTransact

bool CanTransact()

Not implemented.

wxRecordSet::CanUpdate

bool CanUpdate()

Not implemented.

wxRecordSet::ConstructDefaultSQL

bool ConstructDefaultSQL()

Not implemented.

wxRecordSet::Delete

bool Delete ()

Deletes the current record. Not implemented.

wxRecordSet::Edit

void Edit()

Not implemented.

wxRecordSet::EndQuery

bool EndQuery()

Not implemented.

wxRecordSet::ExecuteSQL

bool ExecuteSQL(**const wxString&** *sql*)

Directly executes a SQL statement. The data will be presented as a normal result set. Note that the recordset must have been created as a snapshot, not dynaset. Dynasets will be implemented in the near future.

Examples of common SQL statements are given in *A selection of SQL commands* (p. 1436).

wxRecordSet::FillVars

void FillVars(**int** *recnum*)

Fills in the user-defined variables of the columns. You can set these variables with wxQueryCol::BindVar. This function will be automatically called after every successful database operation.

wxRecordSet::GetColName

wxString GetColName(**int** *col*)

Returns the name of the column at position *col*. Returns NULL if *col* does not exist.

wxRecordSet::GetColType

short GetColType(**int** *col*)

Returns the data type of the column at position *col*. Returns SQL_TYPE_NULL if *col* does not exist.

short GetColType(**const wxString&** *name*)

The same as above, but uses the column name as the identifier.

See *ODBC SQL data types* (p. 1436) for a list of possible data types.

wxRecordSet::GetColumns

bool GetColumns(**const wxString&** *table = NULL*)

Returns the columns of the table with the specified name. If no name is given the class member *tablename* will be used. If both names are NULL nothing will happen. The data will be presented as a normal result set, organized as follows:

0 (VARCHAR)	TABLE_QUALIFIER
1 (VARCHAR)	TABLE_OWNER
2 (VARCHAR)	TABLE_NAME
3 (VARCHAR)	COLUMN_NAME
4 (SMALLINT)	DATA_TYPE
5 (VARCHAR)	TYPE_NAME
6 (INTEGER)	PRECISION
7 (INTEGER)	LENGTH
8 (SMALLINT)	SCALE
9 (SMALLINT)	RADIX
10 (SMALLINT)	NULLABLE
11 (VARCHAR)	REMARKS

wxRecordSet::GetCurrentRecord

long GetCurrentRecord()

Not implemented.

wxRecordSet::GetDatabase

wxDatabase * GetDatabase ()

Returns the wxDatabase object bound to a wxRecordSet.

wxRecordSet::GetDataSources

bool GetDataSources()

Gets the currently-defined data sources via the ODBC manager. The data will be presented as a normal result set. See the documentation for the ODBC function SQLDataSources for how the data is organized.

Example:
```
  wxDatabase Database;

  wxRecordSet *Record = new wxRecordSet(&Database);

  if (!Record->GetDataSources()) {
    char buf[300];
    sprintf(buf, "%s %s\n", Database.GetErrorClass(),
Database.GetErrorMessage());
    frame->output->SetValue(buf);
  }
  else {
    do {
      frame->DataSource->Append((char*)Record->GetFieldDataPtr(0,
SQL_CHAR));
    } while (Record->MoveNext());
  }
```

wxRecordSet::GetDefaultConnect

wxString GetDefaultConnect()

Not implemented.

wxRecordSet::GetDefaultSQL

wxString GetDefaultSQL()

Not implemented.

wxRecordSet::GetErrorCode

wxRETCODE GetErrorCode ()

Returns the error code of the last ODBC action. This will be one of:

SQL_ERROR   General error.
SQL_INVALID_HANDLE   An invalid handle was passed to an ODBC
                                   function.
SQL_NEED_DATA   ODBC expected some data.
SQL_NO_DATA_FOUND   No data was found by this ODBC call.
SQL_SUCCESS   The call was successful.
SQL_SUCCESS_WITH_INFO   The call was successful, but further information
                                   can be obtained from the ODBC manager.

wxRecordSet::GetFieldData

bool GetFieldData(**int** *col*, **int** *dataType*, **void ****dataPtr*)

Copies the current data of the column at position *col* into the buffer *dataPtr*. To be sure to get the right type of data, the user has to pass the correct data type. The function returns FALSE if *col* does not exist or the wrong data type was given.

bool GetFieldData(**const wxString&** *name*, **int** *dataType*, **void ****dataPtr*)

The same as above, but uses the column name as the identifier.

See *ODBC SQL data types* (p. 1436) for a list of possible data types.

wxRecordSet::GetFieldDataPtr

void * GetFieldDataPtr(**int** *col*, **int** *dataType*)

Returns the current data pointer of the column at position *col*. To be sure to get the right type of data, the user has to pass the data type. Returns NULL if *col* does not exist or if *dataType* is incorrect.

void * GetFieldDataPtr(**const wxString&** *name*, **int** *dataType*)

The same as above, but uses the column name as the identifier.

See *ODBC SQL data types* (p. 1436) for a list of possible data types.

wxRecordSet::GetFilter

wxString GetFilter()

Returns the current filter.

wxRecordSet::GetForeignKeys

bool GetPrimaryKeys(**const wxString&** *ptable* = *NULL*, **const wxString&** *ftable* = *NULL*)

Returns a list of foreign keys in the specified table (columns in the specified table that refer to primary keys in other tables), or a list of foreign keys in other tables that refer to the primary key in the specified table.

If *ptable* contains a table name, this function returns a result set containing the primary key of the specified table.

If *ftable* contains a table name, this functions returns a result set of containing all of the foreign keys in the specified table and the primary keys (in other tables) to which they refer.

If both *ptable* and *ftable* contain table names, this function returns the foreign keys in the table specified in *ftable* that refer to the primary key of the table specified in *ptable*. This should be one key at most.

GetForeignKeys returns results as a standard result set. If the foreign keys associated with a primary key are requested, the result set is ordered by FKTABLE_QUALIFIER, FKTABLE_OWNER, FKTABLE_NAME, and KEY_SEQ. If the primary keys associated with a foreign key are requested, the result set is ordered by PKTABLE_QUALIFIER, PKTABLE_OWNER, PKTABLE_NAME, and KEY_SEQ. The following table lists the columns in the result set.

0 (VARCHAR)	PKTABLE_QUALIFIER
1 (VARCHAR)	PKTABLE_OWNER
2 (VARCHAR)	PKTABLE_NAME
3 (VARCHAR)	PKCOLUMN_NAME
4 (VARCHAR)	FKTABLE_QUALIFIER
5 (VARCHAR)	FKTABLE_OWNER
6 (VARCHAR)	FKTABLE_NAME
7 (VARCHAR)	FKCOLUMN_NAME
8 (SMALLINT)	KEY_SEQ
9 (SMALLINT)	UPDATE_RULE
10 (SMALLINT)	DELETE_RULE
11 (VARCHAR)	FK_NAME
12 (VARCHAR)	PK_NAME

wxRecordSet::GetNumberCols

long GetNumberCols()

Returns the number of columns in the result set.

wxRecordSet::GetNumberFields

int GetNumberFields()

Not implemented.

wxRecordSet::GetNumberParams

int GetNumberParams()

Not implemented.

wxRecordSet::GetNumberRecords

long GetNumberRecords()

Returns the number of records in the result set.

wxRecordSet::GetPrimaryKeys

bool GetPrimaryKeys(**const wxString&** *table* = *NULL*)

Returns the column names that comprise the primary key of the table with the specified name. If no name is given the class member *tablename* will be used. If both names are NULL nothing will happen. The data will be presented as a normal result set, organized as follows:

0 (VARCHAR)	TABLE_QUALIFIER
1 (VARCHAR)	TABLE_OWNER
2 (VARCHAR)	TABLE_NAME
3 (VARCHAR)	COLUMN_NAME
4 (SMALLINT)	KEY_SEQ
5 (VARCHAR)	PK_NAME

wxRecordSet::GetOptions

int GetOptions()

Returns the options of the wxRecordSet. Options are not supported yet.

wxRecordSet::GetResultSet

bool GetResultSet()

Copies the data presented by ODBC into wxRecordSet. Depending on the wxRecordSet type all or only one record(s) will be copied. Usually this function will be called automatically after each successful database operation.

wxRecordSet::GetSortString

wxString GetSortString()

Not implemented.

wxRecordSet::GetSQL

wxString GetSQL()

Not implemented.

wxRecordSet::GetTableName

wxString GetTableName ()

Returns the name of the current table.

wxRecordSet::GetTables

bool GetTables()

Gets the tables of a database. The data will be presented as a normal result set, organized as follows:

0 (VARCHAR)	TABLE_QUALIFIER
1 (VARCHAR)	TABLE_OWNER
2 (VARCHAR)	TABLE_NAME
3 (VARCHAR)	TABLE_TYPE (TABLE, VIEW, SYSTEM TABLE, GLOBAL TEMPORARY, LOCAL TEMPORARY, ALIAS, SYNONYM, or database-specific type)
4 (VARCHAR)	REMARKS

wxRecordSet::GetType

int GetType()

Returns the type of the wxRecordSet: wxOPEN_TYPE_DYNASET or wxOPEN_TYPE_SNAPSHOT. See the wxRecordSet description for details.

wxRecordSet::GoTo

bool GoTo(**long** *n*)

Moves the cursor to the record with the number n, where the first record has the number 0.

wxRecordSet::IsBOF

bool IsBOF()

Returns TRUE if the user tried to move the cursor before the first record in the set.

wxRecordSet::IsFieldDirty

bool IsFieldDirty(**int** *field*)

Returns TRUE if the given field has been changed but not saved yet.

bool IsFieldDirty(**const wxString&** *name*)

Same as above, but uses the column name as the identifier.

wxRecordSet::IsFieldNull

bool IsFieldNull(**int** *field*)

Returns TRUE if the given field has no data.

bool IsFieldNull(**const wxString&** *name*)

Same as above, but uses the column name as the identifier.

wxRecordSet::IsColNullable

bool IsColNullable(**int** *col*)

Returns TRUE if the given column may contain no data.

bool IsColNullable(**const wxString&** *name*)

Same as above, but uses the column name as the identifier.

wxRecordSet::IsEOF

bool IsEOF()

Returns TRUE if the user tried to move the cursor behind the last record in the set.

wxRecordSet::IsDeleted

bool IsDeleted()

Not implemented.

wxRecordSet::IsOpen

bool IsOpen()

Returns TRUE if the parent database is open.

wxRecordSet::Move

bool Move(**long** *rows*)

Moves the cursor a given number of rows. Negative values are allowed.
wxRecordSet::MoveFirst

bool MoveFirst()

Moves the cursor to the first record.
wxRecordSet::MoveLast

bool MoveLast()

Moves the cursor to the last record.
wxRecordSet::MoveNext

bool MoveNext()

Moves the cursor to the next record.
wxRecordSet::MovePrev

bool MovePrev()

Moves the cursor to the previous record.
wxRecordSet::Query

bool Query(**const wxString&** *columns*, **const wxString&** *table*, **const wxString&** *filter = NULL*)

Start a query. An SQL string of the following type will automatically be generated and executed: "SELECT columns FROM table WHERE filter".

wxRecordSet::RecordCountFinal

bool RecordCountFinal()

Not implemented.
wxRecordSet::Requery

bool Requery()

Re-executes the last query. Not implemented.

wxRecordSet::SetFieldDirty

void SetFieldDirty(**int** *field*, **bool** *dirty = TRUE*)

Sets the dirty tag of the field field. Not implemented.

void SetFieldDirty(**const wxString&** *name*, **bool** *dirty = TRUE*)

Same as above, but uses the column name as the identifier.

wxRecordSet::SetDefaultSQL

void SetDefaultSQL(**const wxString&** *s*)

Not implemented.

wxRecordSet::SetFieldNull

void SetFieldNull(**void** **p*, **bool** *isNull = TRUE*)

Not implemented.

wxRecordSet::SetOptions

void SetOptions(**int** *opt*)

Sets the options of the wxRecordSet. Not implemented.

wxRecordSet::SetTableName

void SetTableName(**const wxString&** *tablename*)

Specify the name of the table you want to use.

wxRecordSet::SetType

void SetType(**int** *type*)

Sets the type of the wxRecordSet. See the wxRecordSet class description for details.

wxRecordSet::Update

bool Update()

Writes back the current record. Not implemented.

wxRegion

A wxRegion represents a simple or complex region on a device context or window. It uses reference counting, so copying and assignment operations are fast.

Derived from

wxGDIObject (p. 477)
wxObject (p. 750)

Include files

<wx/region.h>

See also

wxRegionIterator (p. 894)

wxRegion::wxRegion

wxRegion()

Default constructor.

wxRegion(**long** *x*, **long** *y*, **long** *width*, **long** *height*)

Constructs a rectangular region with the given position and size.

wxRegion(**const wxPoint&** *topLeft*, **const wxPoint&** *bottomRight*)

Constructs a rectangular region from the top left point and the bottom right point.

wxRegion(**const wxRect&** *rect*)

Constructs a rectangular region a wxRect object.

wxRegion(**const wxRegion&** *region*)

Constructs a region by copying another region.

wxRegion::~wxRegion

~wxRegion()

Destructor.

wxRegion::Clear

void Clear()

Clears the current region.

wxRegion::Contains

wxRegionContain Contains(**long&** *x*, **long&** *y*) **const**

Returns a value indicating whether the given point is contained within the region.

wxRegionContain Contains(**const wxPoint&** *pt*) **const**

Returns a value indicating whether the given point is contained within the region.

wxRegionContain Contains(**long&** *x*, **long&** *y*, **long&** *width*, **long&** *height*) **const**

Returns a value indicating whether the given rectangle is contained within the region.

wxRegionContain Contains(**const wxRect&** *rect*) **const**

Returns a value indicating whether the given rectangle is contained within the region.

Return value

The return value is one of wxOutRegion, wxPartRegion and wxInRegion.

On Windows, only wxOutRegion and wxInRegion are returned; a value wxInRegion then indicates that all or some part of the region is contained in this region.

wxRegion::GetBox

void GetBox(**long&** *x*, **long&** *y*, **long&** *width*, **long&** *height*) **const**

Returns the outer bounds of the region.

wxRect GetBox() **const**

Returns the outer bounds of the region.

wxRegion::Intersect

bool Intersect(**long** *x*, **long** *y*, **long** *width*, **long** *height*)

Finds the intersection of this region and another, rectangular region, specified using position and size.

bool Intersect(**const wxRect&** *rect*)

Finds the intersection of this region and another, rectangular region.

bool Intersect(**const wxRegion&** *region*)

Finds the intersection of this region and another region.

Return value

TRUE if successful, FALSE otherwise.

Remarks

Creates the intersection of the two regions, that is, the parts which are in both regions. The result is stored in this region.

wxRegion::IsEmpty

bool IsEmpty() **const**

Returns TRUE if the region is empty, FALSE otherwise.

wxRegion::Subtract

bool Subtract(**const wxRect&** *rect*)

Subtracts a rectangular region from this region.

bool Subtract(**const wxRegion&** *region*)

Subtracts a region from this region.

Return value

TRUE if successful, FALSE otherwise.

Remarks

This operation combines the parts of 'this' region that are not part of the second region.

The result is stored in this region.

wxRegion::Union

bool Union(**long** *x*, **long** *y*, **long** *width*, **long** *height*)

Finds the union of this region and another, rectangular region, specified using position and size.

bool Union(**const wxRect&** *rect*)

Finds the union of this region and another, rectangular region.

bool Union(**const wxRegion&** *region*)

Finds the union of this region and another region.

Return value

TRUE if successful, FALSE otherwise.

Remarks

This operation creates a region that combines all of this region and the second region. The result is stored in this region.

wxRegion::Xor

bool Xor(**long** *x*, **long** *y*, **long** *width*, **long** *height*)

Finds the Xor of this region and another, rectangular region, specified using position and size.

bool Xor(**const wxRect&** *rect*)

Finds the Xor of this region and another, rectangular region.

bool Xor(**const wxRegion&** *region*)

Finds the Xor of this region and another region.

Return value

TRUE if successful, FALSE otherwise.

Remarks

This operation creates a region that combines all of this region and the second region,

except for any overlapping areas. The result is stored in this region.

wxRegion::operator =

void operator =(**const wxRegion&** *region*)

Copies *region* by reference counting.

wxRegionIterator

This class is used to iterate through the rectangles in a region, typically when examining the damaged regions of a window within an OnPaint call.

To use it, construct an iterator object on the stack and loop through the regions, testing the object and incrementing the iterator at the end of the loop.

See *wxWindow::OnPaint* (p. 1219) for an example of use.

Derived from

wxObject (p. 750)

Include files

<wx/region.h>

See also

wxWindow::OnPaint (p. 1219)

wxRegionIterator::wxRegionIterator

wxRegionIterator()

Default constructor.

wxRegionIterator(**const wxRegion&** *region*)

Creates an iterator object given a region.

wxRegionIterator::GetX

long GetX() **const**

Returns the x value for the current region.

wxRegionIterator::GetY

long GetY() **const**

Returns the y value for the current region.

wxRegionIterator::GetW

long GetW() **const**

An alias for GetWidth.

wxRegionIterator::GetWidth

long GetWidth() **const**

Returns the width value for the current region.

wxRegionIterator::GetH

long GetH() **const**

An alias for GetHeight.

wxRegionIterator::GetHeight

long GetWidth() **const**

Returns the width value for the current region.

wxRegionIterator::GetRect

wxRect GetRect() **const**

Returns the current rectangle.

wxRegionIterator::HaveRects

bool HaveRects() const

Returns TRUE if there are still some rectangles; otherwise returns FALSE.

wxRegionIterator::Reset

void Reset()

Resets the iterator to the beginning of the rectangles.

void Reset(const wxRegion& *region*)

Resets the iterator to the given region.

wxRegionIterator::operator ++

void operator ++()

Increment operator. Increments the iterator to the next region.

wxPython note: A wxPython alias for this operator is called `Next`.

wxRegionIterator::operator bool

operator bool() const

Returns TRUE if there are still some rectangles; otherwise returns FALSE.

You can use this to test the iterator object as if it were of type bool.

wxSashEvent

A sash event is sent when the sash of a *wxSashWindow* (p. 901) has been dragged by the user.

Derived from

wxCommandEvent (p. 153)
wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/sashwin.h>

Event table macros

To process an activate event, use these event handler macros to direct input to a member function that takes a wxSashEvent argument.

EVT_SASH_DRAGGED(id, func)   Process a wxEVT_SASH_DRAGGED event, when the user has finished dragging a sash.
EVT_SASH_DRAGGED_RANGE(id1, id2, func)   Process a wxEVT_SASH_DRAGGED_RANGE event, when the user has finished dragging a sash. The event handler is called when windows with ids in the given range have their sashes dragged.

Data structures

```
enum wxSashDragStatus
{
    wxSASH_STATUS_OK,
    wxSASH_STATUS_OUT_OF_RANGE
};
```

Remarks

When a sash belonging to a sash window is dragged by the user, and then released, this event is sent to the window, where it may be processed by an event table entry in a derived class, a plug-in event handler or an ancestor class.

Note that the wxSashWindow doesn't change the window's size itself. It relies on the application's event handler to do that. This is because the application may have to handle other consequences of the resize, or it may wish to veto it altogether. The event handler should look at the drag rectangle: see *wxSashEvent::GetDragRect* (p. 898) to see what the new size of the window would be if the resize were to be applied. It should also call *wxSashEvent::GetDragStatus* (p. 898) to see whether the drag was OK or out of the current allowed range.

See also

wxSashWindow (p. 901), *Event handling overview* (p. 1372)

wxSashEvent::wxSashEvent

wxSashEvent(**int** *id = 0*, **wxSashEdgePosition** *edge = wxSASH_NONE*)

Constructor.

wxSashEvent::GetEdge

wxSashEdgePosition GetEdge() const

Returns the dragged edge. The return value is one of wxSASH_TOP, wxSASH_RIGHT, wxSASH_BOTTOM, wxSASH_LEFT.

wxSashEvent::GetDragRect

wxRect GetDragRect() const

Returns the rectangle representing the new size the window would be if the resize was applied. It is up to the application to set the window size if required.

wxSashEvent::GetDragStatus

wxSashDragStatus GetDragStatus() const

Returns the status of the sash: one of wxSASH_STATUS_OK, wxSASH_STATUS_OUT_OF_RANGE. If the drag caused the notional bounding box of the window to flip over, for example, the drag will be out of rage.

wxSashLayoutWindow

wxSashLayoutWindow responds to OnCalculateLayout events generated by *wxLayoutAlgorithm* (p. 614). It allows the application to use simple accessors to specify how the window should be laid out, rather than having to respond to events. The fact that the class derives from wxSashWindow allows sashes to be used if required, to allow the windows to be user-resizable.

The documentation for *wxLayoutAlgorithm* (p. 614) explains the purpose of this class in more detail.

Derived from

wxSashWindow (p. 901)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/laywin.h>

Window styles

See *wxSashWindow* (p. 901).

Event handling

This class handles the EVT_QUERY_LAYOUT_INFO and EVT_CALCULATE_LAYOUT events for you. However, if you use sashes, see *wxSashWindow* (p. 901) for relevant event information.

See also *wxLayoutAlgorithm* (p. 614) for information about the layout events.

See also

wxLayoutAlgorithm (p. 614), *wxSashWindow* (p. 901), *Event handling overview* (p. 1372)

wxSashLayoutWindow::wxSashLayoutWindow

wxSashLayoutWindow()

Default constructor.

wxSashLayoutWindow(**wxSashLayoutWindow*** *parent*, **wxSashLayoutWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxCLIP_CHILDREN | wxSW_3D*, **const wxString&** *name = "layoutWindow"*)

Constructs a sash layout window, which can be a child of a frame, dialog or any other non-control window.

Parameters

parent
      Pointer to a parent window.

id
      Window identifier. If -1, will automatically create an identifier.

pos
      Window position. wxDefaultPosition is (-1, -1) which indicates that wxSashLayoutWindows should generate a default position for the window. If using the wxSashLayoutWindow class directly, supply an actual position.

size
      Window size. wxDefaultSize is (-1, -1) which indicates that wxSashLayoutWindows

should generate a default size for the window.

style
Window style. For window styles, please see *wxSashLayoutWindow* (p. 898).

name
Window name.

wxSashLayoutWindow::~wxSashLayoutWindow

~wxSashLayoutWindow()

Destructor.

wxSashLayoutWindow::GetAlignment

wxLayoutAlignment GetAlignment() **const**

Returns the alignment of the window: one of wxLAYOUT_TOP, wxLAYOUT_LEFT, wxLAYOUT_RIGHT, wxLAYOUT_BOTTOM.

wxSashLayoutWindow::GetOrientation

wxLayoutOrientation GetOrientation() **const**

Returns the orientation of the window: one of wxLAYOUT_HORIZONTAL, wxLAYOUT_VERTICAL.

wxSashLayoutWindow::OnCalculateLayout

void OnCalculateLayout(**wxCalculateLayoutEvent&** *event*)

The default handler for the event that is generated by wxLayoutAlgorithm. The implementation of this function calls wxCalculateLayoutEvent::SetRect to shrink the provided size according to how much space this window takes up. For further details, see *wxLayoutAlgorithm* (p. 614) and *wxCalculateLayoutEvent* (p. 94).

wxSashLayoutWindow::OnQueryLayoutInfo

void OnQueryLayoutInfo(**wxQueryLayoutInfoEvent&** *event*)

The default handler for the event that is generated by OnCalculateLayout to get size, alignment and orientation information for the window. The implementation of this function uses member variables as set by accessors called by the application. For further details, see *wxLayoutAlgorithm* (p. 614) and *wxQueryLayoutInfoEvent* (p. 860).

wxSashLayoutWindow::SetAlignment

void SetAlignment(**wxLayoutAlignment** *alignment*)

Sets the alignment of the window (which edge of the available parent client area the window is attached to). *alignment* is one of wxLAYOUT_TOP, wxLAYOUT_LEFT, wxLAYOUT_RIGHT, wxLAYOUT_BOTTOM.

wxSashLayoutWindow::SetDefaultSize

void SetDefaultSize(**const wxSize&** *size*)

Sets the default dimensions of the window. The dimension other than the orientation will be fixed to this value, and the orientation dimension will be ignored and the window stretched to fit the available space.

wxSashLayoutWindow::SetOrientation

void SetOrientation(**wxLayoutOrientation** *orientation*)

Sets the orientation of the window (the direction the window will stretch in, to fill the available parent client area). *orientation* is one of wxLAYOUT_HORIZONTAL, wxLAYOUT_VERTICAL.

wxSashWindow

wxSashWindow allows any of its edges to have a sash which can be dragged to resize the window. The actual content window will be created by the application as a child of wxSashWindow. The window (or an ancestor) will be notified of a drag via a *wxSashEvent* (p. 896) notification.

Derived from

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/sashwin.h>

Window styles

The following styles apply in addition to the normal wxWindow styles.

wxSW_3D   Draws a 3D effect sash and border.
wxSW_3DSASH   Draws a 3D effect sash.
wxSW_3DBORDER   Draws a 3D effect border.
wxSW_BORDER   Draws a thin black border.

See also *window styles overview* (p. 1379).

Event handling

EVT_SASH_DRAGGED(id, func)   Process a wxEVT_SASH_DRAGGED event,
                                        when the user has finished dragging a sash.
EVT_SASH_DRAGGED_RANGE(id1, id2, func)   Process a
                                        wxEVT_SASH_DRAGGED_RANGE event,
                                        when the user has finished dragging a sash.
                                        The event handler is called when windows with
                                        ids in the given range have their sashes
                                        dragged.

Data types

```
enum wxSashEdgePosition {
    wxSASH_TOP = 0,
    wxSASH_RIGHT,
    wxSASH_BOTTOM,
    wxSASH_LEFT,
    wxSASH_NONE = 100
};
```


See also

wxSashEvent (p. 896), *wxSashLayoutWindow* (p. 898), *Event handling overview* (p. 1372)

wxSashWindow::wxSashWindow

wxSashWindow()

Default constructor.

wxSashWindow(**wxSashWindow*** *parent*, **wxSashWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxCLIP_CHILDREN | wxSW_3D*, **const wxString&** *name* = *"sashWindow"*)

Constructs a sash window, which can be a child of a frame, dialog or any other non-control window.

Parameters

parent

Pointer to a parent window.

id

Window identifier. If -1, will automatically create an identifier.

pos

Window position. wxDefaultPosition is (-1, -1) which indicates that wxSashWindows should generate a default position for the window. If using the wxSashWindow class directly, supply an actual position.

size

Window size. wxDefaultSize is (-1, -1) which indicates that wxSashWindows should generate a default size for the window.

style

Window style. For window styles, please see *wxSashWindow* (p. 901).

name

Window name.

wxSashWindow::~wxSashWindow

~wxSashWindow()

Destructor.

wxSashWindow::GetSashVisible

bool GetSashVisible(**wxSashEdgePosition** *edge*) **const**

Returns TRUE if a sash is visible on the given edge, FALSE otherwise.

Parameters

edge

Edge. One of wxSASH_TOP, wxSASH_RIGHT, wxSASH_BOTTOM, wxSASH_LEFT.

See also

wxSashWindow::SetSashVisible (p. 905)

wxSashWindow::GetMaximumSizeX

int **GetMaximumSizeX**() **const**

Gets the maximum window size in the x direction.

wxSashWindow::GetMaximumSizeY

int **GetMaximumSizeY**() **const**

Gets the maximum window size in the y direction.

wxSashWindow::GetMinimumSizeX

int **GetMinimumSizeX**()

Gets the minimum window size in the x direction.

wxSashWindow::GetMinimumSizeY

int **GetMinimumSizeY**(**int** *min*) **const**

Gets the minimum window size in the y direction.

wxSashWindow::HasBorder

bool **HasBorder**(**wxSashEdgePosition** *edge*) **const**

Returns TRUE if the sash has a border, FALSE otherwise.

Parameters

edge
    Edge. One of wxSASH_TOP, wxSASH_RIGHT, wxSASH_BOTTOM,
    wxSASH_LEFT.

See also

wxSashWindow::SetSashBorder (p. 905)

wxSashWindow::SetMaximumSizeX

void SetMaximumSizeX(**int** *min*)

Sets the maximum window size in the x direction.

wxSashWindow::SetMaximumSizeY

void SetMaximumSizeY(**int** *min*)

Sets the maximum window size in the y direction.

wxSashWindow::SetMinimumSizeX

void SetMinimumSizeX(**int** *min*)

Sets the minimum window size in the x direction.

wxSashWindow::SetMinimumSizeY

void SetMinimumSizeY(**int** *min*)

Sets the minimum window size in the y direction.

wxSashWindow::SetSashVisible

void SetSashVisible(**wxSashEdgePosition** *edge*, **bool** *visible*)

Call this function to make a sash visible or invisible on a particular edge.

Parameters

edge
    Edge to change. One of wxSASH_TOP, wxSASH_RIGHT, wxSASH_BOTTOM, wxSASH_LEFT.

visible
    TRUE to make the sash visible, FALSE to make it invisible.

See also

wxSashWindow::GetSashVisible (p. 903)

wxSashWindow::SetSashBorder

void SetSashBorder(**wxSashEdgePosition** *edge*, **bool** *hasBorder*)

Call this function to give the sash a border, or remove the border.

Parameters

edge
> Edge to change. One of wxSASH_TOP, wxSASH_RIGHT, wxSASH_BOTTOM, wxSASH_LEFT.

hasBorder
> TRUE to give the sash a border visible, FALSE to remove it.

See also

wxSashWindow::HashBorder (p. 904)

wxScreenDC

A wxScreenDC can be used to paint on the screen. This should normally be constructed as a temporary stack object; don't store a wxScreenDC object.

Derived from

wxDC (p. 282)

Include files

<wx/dcscreen.h>

See also

wxDC (p. 282), *wxMemoryDC* (p. 682), *wxPaintDC* (p. 763), *wxClientDC* (p. 121), *wxWindowDC* (p. 1240)

wxScreenDC::wxScreenDC

wxScreenDC()

Constructor.

wxScreenDC::StartDrawingOnTop

bool StartDrawingOnTop(**wxWindow*** *window*)

bool StartDrawingOnTop(**wxRect*** *rect = NULL*)

Use this in conjunction with *EndDrawingOnTop* (p. 907) to ensure that drawing to the screen occurs on top of existing windows. Without this, some window systems (such as X) only allow drawing to take place underneath other windows.

By using the first form of this function, an application is specifying that the area that will be drawn on coincides with the given window.

By using the second form, an application can specify an area of the screen which is to be drawn on. If NULL is passed, the whole screen is available.

It is recommended that an area of the screen is specified because with large regions, flickering effects are noticeable when destroying the temporary transparent window used to implement this feature.

You might use this pair of functions when implementing a drag feature, for example as in the *wxSplitterWindow* (p. 978) implementation.

Remarks

This function is probably obsolete since the X implementations allow drawing directly on the screen now. However, the fact that this function allows the screen to be refreshed afterwards, may be useful to some applications.

wxScreenDC::EndDrawingOnTop

bool EndDrawingOnTop()

Use this in conjunction with *StartDrawingOnTop* (p. 906).

This function destroys the temporary window created to implement on-top drawing (X only).

wxScrollBar

A wxScrollBar is a control that represents a horizontal or vertical scrollbar. It is distinct from the two scrollbars that some windows provide automatically, but the two types of scrollbar share the way events are received.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/scrolbar.h>

Remarks

A scrollbar has the following main attributes: *range*, *thumb size*, *page size*, and *position*.

The range is the total number of units associated with the view represented by the scrollbar. For a table with 15 columns, the range would be 15.

The thumb size is the number of units that are currently visible. For the table example, the window might be sized so that only 5 columns are currently visible, in which case the application would set the thumb size to 5. When the thumb size becomes the same as or greater than the range, the scrollbar will be automatically hidden on most platforms.

The page size is the number of units that the scrollbar should scroll by, when 'paging' through the data. This value is normally the same as the thumb size length, because it is natural to assume that the visible window size defines a page.

The scrollbar position is the current thumb position.

Most applications will find it convenient to provide a function called **AdjustScrollbars** which can be called initially, from an **OnSize** event handler, and whenever the application data changes in size. It will adjust the view, object and page size according to the size of the window and the size of the data.

Window styles

wxSB_HORIZONTAL   Specifies a horizontal scrollbar.
wxSB_VERTICAL   Specifies a vertical scrollbar.

See also *window styles overview* (p. 1379).

Event handling

To process input from a scrollbar, use one of these event handler macros to direct input to member functions that take a *wxScrollEvent* (p. 914) argument:

EVT_COMMAND_SCROLL(id, func)   Catch all scroll commands.
EVT_COMMAND_SCROLL_TOP(id, func) Catch a command to put the scroll thumb at the maximum position.
EVT_COMMAND_SCROLL_BOTTOM(id, func)   Catch a command to put the scroll thumb at the maximum position.
EVT_COMMAND_SCROLL_LINEUP(id, func)   Catch a line up command.
EVT_COMMAND_SCROLL_LINEDOWN(id, func) Catch a line down command.
EVT_COMMAND_SCROLL_PAGEUP(id, func)   Catch a page up command.
EVT_COMMAND_SCROLL_PAGEDOWN(id, func)   Catch a page down command.

EVT_COMMAND_SCROLL_THUMBTRACK(id, func)   Catch a thumbtrack
command (continuous movement of the scroll
thumb).

See also

Scrolling overview (p. 1395), *Event handling overview* (p. 1372), *wxScrolledWindow* (p. 916)

---

wxScrollBar::wxScrollBar

wxScrollBar()

Default constructor.

wxScrollBar(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxSB_HORIZONTAL*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"scrollBar"*)

Constructor, creating and showing a scrollbar.

Parameters

parent
    Parent window. Must not be NULL.

id
    Window identifier. A value of -1 indicates a default value.

pos
    Window position. If the position (-1, -1) is specified then a default position is chosen.

size
    Window size. If the default size (-1, -1) is specified then a default size is chosen.

style
    Window style. See *wxScrollBar* (p. 907).

validator
    Window validator.

name
    Window name.

See also

---

wxScrollBar::Create (p. 910), *wxValidator* (p. 1172)

wxScrollBar::~wxScrollBar

void ~wxScrollBar()

Destructor, destroying the scrollbar.

wxScrollBar::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxSB_HORIZONTAL*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"scrollBar"*)

Scrollbar creation function called by the scrollbar constructor. See *wxScrollBar::wxScrollBar* (p. 909) for details.

wxScrollBar::GetRange

int GetRange() **const**

Returns the length of the scrollbar.

See also

wxScrollBar::SetScrollbar (p. 911)

wxScrollBar::GetPageSize

int GetPageSize() **const**

Returns the page size of the scrollbar. This is the number of scroll units that will be scrolled when the user pages up or down. Often it is the same as the thumb size.

See also

wxScrollBar::SetScrollbar (p. 911)

wxScrollBar::GetThumbPosition

int GetThumbPosition() **const**

Returns the current position of the scrollbar thumb.

wxScrollBar::SetThumbPosition (p. 911)

wxScrollBar::GetThumbLength

int **GetThumbLength**() **const**

Returns the thumb or 'view' size.

See also

wxScrollBar::SetScrollbar (p. 911)

wxScrollBar::SetThumbPosition

void **SetThumbPosition**(**int** *viewStart*)

Sets the position of the scrollbar.

Parameters

viewStart
> The position of the scrollbar thumb.

See also

wxScrollBar::GetThumbPosition (p. 910)

wxScrollBar::SetScrollbar

virtual void **SetScrollbar**(**int** *position*, **int** *thumbSize*, **int** *range*, **int** *pageSize*, **const bool** *refresh* = *TRUE*)

Sets the scrollbar properties.

Parameters

position
> The position of the scrollbar in scroll units.

thumbSize
> The size of the thumb, or visible portion of the scrollbar, in scroll units.

range
> The maximum position of the scrollbar.

pageSize
> The size of the page size in scroll units. This is the number of units the scrollbar will scroll when it is paged up or down. Often it is the same as the thumb size.

refresh
> TRUE to redraw the scrollbar, FALSE otherwise.

Remarks

Let's say you wish to display 50 lines of text, using the same font. The window is sized so that you can only see 16 lines at a time.

You would use:

```
scrollbar->SetScrollbar(0, 16, 50, 15);
```

The page size is 1 less than the thumb size so that the last line of the previous page will be visible on the next page, to help orient the user.

Note that with the window at this size, the thumb position can never go above 50 minus 16, or 34.

You can determine how many lines are currently visible by dividing the current view size by the character height in pixels.

When defining your own scrollbar behaviour, you will always need to recalculate the scrollbar settings when the window size changes. You could therefore put your scrollbar calculations and SetScrollbar call into a function named AdjustScrollbars, which can be called initially and also from a *wxWindow::OnSize* (p. 1222) event handler function.

See also

Scrolling overview (p. 1395), *wxWindow::SetScrollbar* (p. 1232), *wxScrolledWindow* (p. 916)

wxScrollWinEvent

A scroll event holds information about events sent from scrolling windows.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a scroll window event, use these event handler macros to direct input to member functions that take a wxScrollWinEvent argument. You can use the EVT_SCROLLWIN... macros for intercepting scroll window events from the receiving window.

EVT_SCROLLWIN(func)	Process all scroll events.
EVT_SCROLLWIN_TOP(func)	Process wxEVT_SCROLLWIN_TOP scroll-to-top events.
EVT_SCROLLWIN_BOTTOM(func)	Process wxEVT_SCROLLWIN_TOP scroll-to-bottom events.
EVT_SCROLLWIN_LINEUP(func)	Process wxEVT_SCROLLWIN_LINEUP line up events.
EVT_SCROLLWIN_LINEDOWN(func)	Process wxEVT_SCROLLWIN_LINEDOWN line down events.
EVT_SCROLLWIN_PAGEUP(func)	Process wxEVT_SCROLLWIN_PAGEUP page up events.
EVT_SCROLLWIN_PAGEDOWN(func)	Process wxEVT_SCROLLWIN_PAGEDOWN page down events.
EVT_SCROLLWIN_THUMBTRACK(func)	Process wxEVT_SCROLLWIN_THUMBTRACK thumbtrack events (frequent events sent as the user drags the thumtrack).
EVT_SCROLLWIN_THUMBRELEASE(func)	Process wxEVT_SCROLLWIN_THUMBRELEASE thumb release events.

See also

wxWindow::OnScroll (p. 1221), *wxScrollEvent* (p. 914), *Event handling overview* (p. 1372)

wxScrollWinEvent::wxScrollWinEvent

 wxScrollWinEvent(**WXTYPE** *commandType = 0*, **int** *id = 0*, **int** *pos = 0*, **int** *orientation = 0*)

Constructor.

wxScrollWinEvent::GetOrientation

int GetOrientation() const

Returns wxHORIZONTAL or wxVERTICAL, depending on the orientation of the scrollbar.

wxScrollWinEvent::GetPosition

int GetPosition() const

Returns the position of the scrollbar.

wxScrollEvent

A scroll event holds information about events sent from stand-alone scrollbars, spin-buttons and sliders. Note that starting from wxWindows 2.1, scrolled windows send the *wxScrollWinEvent* (p. 912) which does not derive from wxCommandEvent, but from wxEvent directly - don't confuse these two kinds of events and use the event table macros mentioned below only for the scrollbar-like controls.

Derived from

wxCommandEvent (p. 153)
wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a scroll event, use these event handler macros to direct input to member functions that take a wxScrollEvent argument. You can use `EVT_COMMAND_SCROLL...` macros with window IDs for when intercepting scroll events from controls, or `EVT_SCROLL...` macros without window IDs for intercepting scroll events from the receiving window - except for this, the macros behave exactly the same

EVT_SCROLL(func)	Process all scroll events.
EVT_SCROLL_TOP(func)	Process wxEVT_SCROLL_TOP scroll-to-top events.
EVT_SCROLL_BOTTOM(func)	Process wxEVT_SCROLL_TOP scroll-to-bottom events.
EVT_SCROLL_LINEUP(func)	Process wxEVT_SCROLL_LINEUP line up events.
EVT_SCROLL_LINEDOWN(func)	Process wxEVT_SCROLL_LINEDOWN line

		down events.
EVT_SCROLL_PAGEUP(func)		Process wxEVT_SCROLL_PAGEUP page up events.
EVT_SCROLL_PAGEDOWN(func)		Process wxEVT_SCROLL_PAGEDOWN page down events.
EVT_SCROLL_THUMBTRACK(func)		Process wxEVT_SCROLL_THUMBTRACK thumbtrack events (frequent events sent as the user drags the thumtrack).
EVT_SCROLL_THUMBRELEASE(func)		Process wxEVT_SCROLL_THUMBRELEASE thumb release events.
EVT_COMMAND_SCROLL(id, func)		Process all scroll events.
EVT_COMMAND_SCROLL_TOP(id, func)		Process wxEVT_SCROLL_TOP scroll-to-top events.
EVT_COMMAND_SCROLL_BOTTOM(id, func)		Process wxEVT_SCROLL_TOP scroll-to-bottom events.
EVT_COMMAND_SCROLL_LINEUP(id, func)		Process wxEVT_SCROLL_LINEUP line up events.
EVT_COMMAND_SCROLL_LINEDOWN(id, func)		Process wxEVT_SCROLL_LINEDOWN line down events.
EVT_COMMAND_SCROLL_PAGEUP(id, func)		Process wxEVT_SCROLL_PAGEUP page up events.
EVT_COMMAND_SCROLL_PAGEDOWN(id, func)		Process wxEVT_SCROLL_PAGEDOWN page down events.
EVT_COMMAND_SCROLL_THUMBTRACK(id, func)		Process wxEVT_SCROLL_THUMBTRACK thumbtrack events (frequent events sent as the user drags the thumtrack).
EVT_COMMAND_SCROLL_THUMBRELEASE(func)		Process wxEVT_SCROLL_THUMBRELEASE thumb release events.

Remarks

Note that unless specifying a scroll control identifier, you will need to test for scrollbar orientation with *wxScrollEvent::GetOrientation* (p. 916), since horizontal and vertical scroll events are processed using the same event handler.

See also

wxScrollBar (p. 907), *wxSlider* (p. 934), *wxSpinButton* (p. 967), *wxScrollWinEvent* (p. 912), *Event handling overview* (p. 1372)

wxScrollEvent::wxScrollEvent

wxScrollEvent(**WXTYPE** *commandType = 0*, **int** *id = 0*, **int** *pos = 0*, **int** *orientation = 0*)

Constructor.

wxScrollEvent::GetOrientation

int GetOrientation() **const**

Returns wxHORIZONTAL or wxVERTICAL, depending on the orientation of the scrollbar.

wxScrollEvent::GetPosition

int GetPosition() **const**

Returns the position of the scrollbar.

wxScrolledWindow

The wxScrolledWindow class manages scrolling for its client area, transforming the coordinates according to the scrollbar positions, and setting the scroll positions, thumb sizes and ranges according to the area in view.

As with all windows, an application can draw onto a wxScrolledWindow using a *device context* (p. 1400).

You have the option of handling the OnPaint handler or overriding the *OnDraw* (p. 921) function, which is passed a pre-scrolled device context (prepared by *PrepareDC* (p. 921)).

If you don't wish to calculate your own scrolling, you must call PrepareDC when not drawing from within OnDraw, to set the device origin for the device context according to the current scroll position.

A wxScrolledWindow will normally scroll itself and therefore its child windows as well. It might however be desired to scroll a different window than itself: e.g. when designing a spreadsheet, you will normally only have to scroll the (usually white) cell area, whereas the (usually grey) label area will scroll very differently. For this special purpose, you can call *SetTargetWindow* (p. 923) which means that pressing the scrollbars will scroll a different window.

Note that the underlying system knows nothing about scrolling coordinates, so that all system functions (mouse events, expose events, refresh calls etc) as well as the position of subwindows are relative to the "physical" origin of the scrolled window. If the user insert a child window at position (10,10) and scrolls the window down 100 pixels (moving

the child window out of the visible area), the child window will report a position of (10,-90).

Derived from

wxPanel (p. 769)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/scrolwin.h>

Window styles

wxRETAINED   Uses a backing pixmap to speed refreshes. Motif only.

See also *window styles overview* (p. 1379).

Remarks

Use wxScrolledWindow for applications where the user scrolls by a fixed amount, and where a 'page' can be interpreted to be the current visible portion of the window. For more sophisticated applications, use the wxScrolledWindow implementation as a guide to build your own scroll behaviour.

See also

wxScrollBar (p. 907), *wxClientDC* (p. 121), *wxPaintDC* (p. 763)

wxScrolledWindow::wxScrolledWindow

wxScrolledWindow()

Default constructor.

wxScrolledWindow(**wxWindow*** *parent*, **wxWindowID** *id = -1*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxHSCROLL | wxVSCROLL*, **const wxString&** *name = "scrolledWindow"*)

Constructor.

Parameters

parent
     Parent window.

id

> Window identifier. A value of -1 indicates a default value.

pos

> Window position. If a position of (-1, -1) is specified then a default position is chosen.

size

> Window size. If a size of (-1, -1) is specified then the window is sized appropriately.

style

> Window style. See *wxScrolledWindow* (p. 916).

name

> Window name.

Remarks

The window is initially created without visible scrollbars. Call *wxScrolledWindow::SetScrollbars* (p. 922) to specify how big the virtual window size should be.

wxScrolledWindow::~wxScrolledWindow

~wxScrolledWindow()

Destructor.

wxScrolledWindow::CalcScrolledPosition

void CalcScrolledPosition(**int** *x*,   **int** *y*,   **int** *xx   **int** *yy) **const**

Translates the logical coordinates to the device ones. For example, if a window is scrolled 10 pixels to the bottom, the device coordinates of the origin are (0, 0) (as always), but the logical coordinates are (0, 10) and so the call to CalcScrolledPosition(0, 0, &xx, &yy) will return 10 in yy.

See also

CalcUnscrolledPosition (p. 918)

wxPython note: The wxPython version of this methods accepts only two parameters and returns xx and yy as a tuple of values.

wxScrolledWindow::CalcUnscrolledPosition

void CalcUnscrolledPosition(**int** *x*, **int** *y*, **int** **xx* **int** **yy*) **const**

Translates the device coordinates to the logical ones. For example, if a window is scrolled 10 pixels to the bottom, the device coordinates of the origin are (0, 0) (as always), but the logical coordinates are (0, 10) and so the call to CalcUnscrolledPosition(0, 10, &xx, &yy) will return 0 in yy.

See also

CalcScrolledPosition (p. 918)

wxPython note: The wxPython version of this methods accepts only two parameters and returns xx and yy as a tuple of values.

wxScrolledWindow::Create

bool Create (**wxWindow*** *parent*, **wxWindowID** *id = -1*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxHSCROLL | wxVSCROLL*, **const wxString&** *name = "scrolledWindow"*)

Creates the window for two-step construction. Derived classes should call or replace this function. See *wxScrolledWindow::wxScrolledWindow* (p. 917) for details.

wxScrolledWindow::EnableScrolling

void EnableScrolling(**const bool** *xScrolling*, **const bool** *yScrolling*)

Enable or disable physical scrolling in the given direction. Physical scrolling is the physical transfer of bits up or down the screen when a scroll event occurs. If the application scrolls by a variable amount (e.g. if there are different font sizes) then physical scrolling will not work, and you should switch it off. Note that you will have to reposition child windows yourself, if physical scrolling is disabled.

Parameters

xScrolling
    If TRUE, enables physical scrolling in the x direction.

yScrolling
    If TRUE, enables physical scrolling in the y direction.

Remarks

Physical scrolling may not be available on all platforms. Where it is available, it is enabled by default.

wxScrolledWindow::GetScrollPixelsPerUnit

void GetScrollPixelsPerUnit(**int*** *xUnit*, **int*** *yUnit*) **const**

Get the number of pixels per scroll unit (line), in each direction, as set by *wxScrolledWindow::SetScrollbars* (p. 922). A value of zero indicates no scrolling in that direction.

Parameters

xUnit
> Receives the number of pixels per horizontal unit.

yUnit
> Receives the number of pixels per vertical unit.

See also

wxScrolledWindow::SetScrollbars (p. 922), *wxScrolledWindow::GetVirtualSize* (p. 920)

wxPython note: The wxPython version of this methods accepts no parameters and returns a tuple of values for xUnit and yUnit.

wxScrolledWindow::GetVirtualSize

void GetVirtualSize(**int*** *x*, **int*** *y*) **const**

Gets the size in device units of the scrollable window area (as opposed to the client size, which is the area of the window currently visible).

Parameters

x
> Receives the length of the scrollable window, in pixels.

y
> Receives the height of the scrollable window, in pixels.

Remarks

Use *wxDC::DeviceToLogicalX* (p. 285) and *wxDC::DeviceToLogicalY* (p. 286) to translate these units to logical units.

See also

wxScrolledWindow::SetScrollbars (p. 922), *wxScrolledWindow::GetScrollPixelsPerUnit* (p. 919)

wxPython note: The wxPython version of this methods accepts no parameters and returns a tuple of values for x and y.

wxScrolledWindow::IsRetained

bool IsRetained() const

Motif only: TRUE if the window has a backing bitmap.

wxScrolledWindow::PrepareDC

void PrepareDC(wxDC& *dc*)

Call this function to prepare the device context for drawing a scrolled image. It sets the device origin according to the current scroll position.

PrepareDC is called automatically within the default wxScrolledWindow::OnPaint event handler, so your *wxScrolledWindow::OnDraw* (p. 921) override will be passed a 'pre-scrolled' device context. However, if you wish to draw from outside of OnDraw (via OnPaint), or you wish to implement OnPaint yourself, you must call this function yourself. For example:

```
void MyWindow::OnEvent(wxMouseEvent& event)
{
  wxClientDC dc(this);
  PrepareDC(dc);

  dc.SetPen(*wxBLACK_PEN);
  float x, y;
  event.Position(&x, &y);
  if (xpos > -1 && ypos > -1 && event.Dragging())
  {
    dc.DrawLine(xpos, ypos, x, y);
  }
  xpos = x;
  ypos = y;
}
```

wxScrolledWindow::OnDraw

virtual void OnDraw(wxDC& *dc*)

Called by the default paint event handler to allow the application to define painting behaviour without having to worry about calling *wxScrolledWindow::PrepareDC* (p. 921).

Instead of overriding this function you may also just process the paint event in the derived class as usual, but then you will have to call PrepareDC() yourself.

wxScrolledWindow::Scroll

void Scroll(**int** *x*, **int** *y*)

Scrolls a window so the view start is at the given point.

Parameters

x

> The x position to scroll to, in scroll units.

y

> The y position to scroll to, in scroll units.

Remarks

The positions are in scroll units, not pixels, so to convert to pixels you will have to multiply by the number of pixels per scroll increment. If either parameter is -1, that position will be ignored (no change in that direction).

See also

wxScrolledWindow::SetScrollbars (p. 922), *wxScrolledWindow::GetScrollPixelsPerUnit* (p. 919)

wxScrolledWindow::SetScrollbars

void SetScrollbars(**int** *pixelsPerUnitX*, **int** *pixelsPerUnitY*, **int** *noUnitsX*, **int** *noUnitsY*, **int** *xPos = 0*, **int** *yPos = 0*, **bool** *noRefresh = FALSE*)

Sets up vertical and/or horizontal scrollbars.

Parameters

pixelsPerUnitX
> Pixels per scroll unit in the horizontal direction.

pixelsPerUnitY
> Pixels per scroll unit in the vertical direction.

noUnitsX
> Number of units in the horizontal direction.

noUnitsY
> Number of units in the vertical direction.

xPos
> Position to initialize the scrollbars in the horizontal direction, in scroll units.

yPos
> Position to initialize the scrollbars in the vertical direction, in scroll units.

noRefresh
    Will not refresh window if TRUE.

Remarks

The first pair of parameters give the number of pixels per 'scroll step', i.e. amount moved when the up or down scroll arrows are pressed. The second pair gives the length of scrollbar in scroll steps, which sets the size of the virtual window.

xPos and *yPos* optionally specify a position to scroll to immediately.

For example, the following gives a window horizontal and vertical scrollbars with 20 pixels per scroll step, and a size of 50 steps (1000 pixels) in each direction.

```
window->SetScrollbars(20, 20, 50, 50);
```

wxScrolledWindow manages the page size itself, using the current client window size as the page size.

Note that for more sophisticated scrolling applications, for example where scroll steps may be variable according to the position in the document, it will be necessary to derive a new class from wxWindow, overriding **OnSize** and adjusting the scrollbars appropriately.

wxScrolledWindow::SetTargetWindow

void SetTargetWindow(**wxWindow*** *window*)

Call this function to tell wxScrolledWindow to perform the actually scrolling on a different window (not on itself).

wxScrolledWindow::GetViewStart

void GetViewStart(**int*** *x*, **int*** *y*) **const**

Get the position at which the visible portion of the window starts.

Parameters

x
    Receives the first visible x position in scroll units.

y
    Receives the first visible y position in scroll units.

Remarks

If either of the scrollbars is not at the home position, *x* and/or *y* will be greater than zero.

Combined with *wxWindow::GetClientSize* (p. 1201), the application can use this function to efficiently redraw only the visible portion of the window. The positions are in logical scroll units, not pixels, so to convert to pixels you will have to multiply by the number of pixels per scroll increment.

See also

wxScrolledWindow::SetScrollbars (p. 922)

wxPython note: The wxPython version of this methods accepts no parameters and returns a tuple of values for x and y.

wxSingleChoiceDialog

This class represents a dialog that shows a list of strings, and allows the user to select one. Double-clicking on a list item is equivalent to single-clicking and then pressing OK.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/choicdlg.h>

See also

wxSingleChoiceDialog overview (p. 1410)

wxSingleChoiceDialog::wxSingleChoiceDialog

 wxSingleChoiceDialog(**wxWindow*** *parent*, **const wxString&** *message*, **const wxString&** *caption*, **int** *n*, **const wxString*** *choices*, **void**** *clientData = NULL*, **long** *style = wxOK | wxCANCEL | wxCENTRE*, **const wxPoint&** *pos = wxDefaultPosition*)

Constructor, taking an array of wxString choices and optional client data.

 wxSingleChoiceDialog(**wxWindow*** *parent*, **const wxString&** *message*, **const wxString&** *caption*, **const wxStringList&** *choices*, **void**** *clientData = NULL*, **long** *style = wxOK | wxCANCEL | wxCENTRE*, **const wxPoint&** *pos = wxDefaultPosition*)

Constructor, taking a string list and optional client data.

Parameters

parent
> Parent window.

message
> Message to show on the dialog.

caption
> The dialog caption.

n
> The number of choices.

choices
> An array of strings, or a string list, containing the choices.

style
> A dialog style (bitlist) containing flags chosen from the following:

wxOK	Show an OK button.
wxCANCEL	Show a Cancel button.
wxCENTRE	Centre the message. Not Windows.

pos
> Dialog position. Not Windows.

Remarks

Use *wxSingleChoiceDialog::ShowModal* (p. 926) to show the dialog.

wxPython note: For Python the two parametes `n` and `choices` are collapsed into a single parameter `choices` which is expected to be a Python list of strings.

wxSingleChoiceDialog::~wxSingleChoiceDialog

~wxSingleChoiceDialog()

Destructor.

wxSingleChoiceDialog::GetSelection

int GetSelection() **const**

Returns the index of selected item.

wxSingleChoiceDialog::GetSelectionClientData

char* GetSelectionClientData() **const**

Returns the client data associated with the selection.

wxSingleChoiceDialog::GetStringSelection

wxString GetStringSelection() **const**

Returns the selected string.

wxSingleChoiceDialog::SetSelection

void SetSelection(**int** *selection*) **const**

Sets the index of the initially selected item.

wxSingleChoiceDialog::ShowModal

int ShowModal()

Shows the dialog, returning either wxID_OK or wxID_CANCEL.

wxSize

A **wxSize** is a useful data structure for graphics operations. It simply contains integer *width* and *height* members.

wxSize is used throughout wxWindows as well as wxPoint which, although almost equivalent to wxSize, has a different meaning: wxPoint represents a position while wxSize - the size.

wxPython note: wxPython defines aliases for the x and y members named width and height since it makes much more sense for sizes.

Derived from

None

Include files

<wx/gdicmn.h>

See also

wxPoint (p. 790), *wxRealPoint* (p. 872)

wxSize::wxSize

wxSize()

wxSize(**int** *width*, **int** *height*)

Creates a size object.

wxSize::GetWidth

int GetWidth() **const**

Gets the width member.

wxSize::GetHeight

int GetHeight() **const**

Gets the height member.

wxSize::Set

void Set(**int** *width*, **int** *height*)

Sets the width and height members.

wxSize::SetHeight

void SetHeight(**int** *height*)

Sets the height.

wxSize::SetWidth

void SetWidth(**int** *width*)

Sets the width.

wxSize::operator =

void operator =(**const wxSize&** *sz*)

Assignment operator.

wxSizeEvent

A size event holds information about size change events.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a size event, use this event handler macro to direct input to a member function that takes a wxSizeEvent argument.

EVT_SIZE(func)   Process a wxEVT_SIZE event.

See also

wxWindow::OnSize (p. 1222), *wxSize* (p. 926), *Event handling overview* (p. 1372)

wxSizeEvent::wxSizeEvent

 wxSizeEvent(**const wxSize&** *sz,* **int** *id = 0*)

Constructor.

wxSizeEvent::GetSize

wxSize GetSize() **const**

Returns the entire size of the window generating the size change event.

wxSizer

wxSizer is the abstract base class used for laying out subwindows in a window. You cannot use wxSizer directly; instead, you will have to use *wxBoxSizer* (p. 77), *wxStaticBoxSizer* (p. 991) or *wxNotebookSizer* (p. 738).

The layout algorithm used by sizers in wxWindows is closely related to layout in other GUI toolkits, such as Java's AWT, the GTK toolkit or the Qt toolkit. It is based upon the idea of the individual subwindows reporting their minimal required size and their ability to get stretched if the size of the parent window has changed. This will most often mean, that the programmer does not set the original size of a dialog in the beginning, rather the dialog will assigned a sizer and this sizer will be queried about the recommended size. The sizer in turn will query its children, which can be normal windows, empty space or other sizers, so that a hierarchy of sizers can be constructed. Note that wxSizer does not derive from wxWindow and thus do not interfere with tab ordering and requires very little resources compared to a real window on screen.

What makes sizers so well fitted for use in wxWindows is the fact that every control reports its own minimal size and the algorithm can handle differences in font sizes or different window (dialog item) sizes on different platforms without problems. If e.g. the standard font as well as the overall design of Motif widgets requires more space than on Windows, the initial dialog size will automatically be bigger on Motif than on Windows.

wxPython note: If you wish to create a sizer class in wxPython you should derive the class from `wxPySizer` in order to get Python-aware capabilities for the various virtual methods.

Derived from

wxObject (p. 750)

wxSizer::wxSizer

 wxSizer()

The constructor. Note that wxSizer is an abstract base class and may not be instantiated.

wxSizer::~wxSizer

~wxSizer()

The destructor.

wxSizer::Add

void Add(**wxWindow*** *window*, **int** *option = 0*,**int** *flag = 0*, **int** *border = 0*, **wxObject*** *userData = NULL*)

void Add(**wxSizer*** *sizer*, **int** *option = 0*, **int** *flag = 0*, **int** *border = 0*, **wxObject*** *userData = NULL*)

void Add(**int** *width*, **int** *height*, **int** *option = 0*, **int** *flag = 0*, **int** *border = 0*, **wxObject*** *userData = NULL*)

Adds the *window* to the sizer. As wxSizer itself is an abstract class, the parameters have no meaning in the wxSizer class itself, but as there currently is only one class deriving directly from wxSizer and this class does not override these methods, the meaning of the parameters is described here:

window
> The window to be added to the sizer. Its initial size (either set explicitly by the user or calculated internally when using wxDefaultSize) is interpreted as the minimal and in many cases also the initial size. This is particularly useful in connection with *SetSizeHints* (p. 934).

sizer
> The (child-)sizer to be added to the sizer. This allows placing a child sizer in a sizer and thus to create hierarchies of sizers (typically a vertical box as the top sizer and several horizontal boxes on the level beneath).

width and height
> The dimension of a spacer to be added to the sizer. Adding spacers to sizers gives more flexilibilty in the design of dialogs; imagine for example a horizontal box with two buttons at the bottom of a dialog: you might want to insert a space between the two buttons and make that space stretchable using the *option* flag and the result will be that the left button will be aligned with the left side of the dialog and the right button with the right side - the space in between will shrink and grow with the dialog.

option
> Although the meaning of this parameter is undefined in wxSizer, it is used in wxBoxSizer to indicate if a child of a sizer can change its size in the main orientation of the wxBoxSizer - where 0 stands for not changable and a value of more than zero is interpreted relative to the value of other children of the same wxBoxSizer. For example, you might have a horizontal wxBoxSizer with three children, two of which are supposed to change their size with the sizer. Then the

two stretchable windows would get a value of 1 each to make them grow and shrink equally with the sizer's horizontal dimension.

flag

This parameter can be used to set a number of flags which can be combined using the binary OR operator |. Two main behaviours are defined using these flags. One is the border around a window: the *border* parameter determines the border width whereas the flags given here determine where the border may be (wxTOP, wxBOTTOM, wxLEFT, wxRIGHT or wxALL). The other flags determine the child window's behaviour if the size of the sizer changes. However this is not - in contrast to the *option* flag - in the main orientation, but in the respectively other orientation. So if you created a wxBoxSizer with the wxVERTICAL option, these flags will be relevant if the sizer changes its horizontal size. A child may get resized to completely fill out the new size (using either wxGROW or wxEXPAND), it may get proportionally resized (wxSHAPED), it may get centered (wxALIGN_CENTER or wxALIGN_CENTRE) or it may get aligned to either side (wxALIGN_LEFT and wxALIGN_TOP are set to 0 and thus represent the default, wxALIGN_RIGHT and wxALIGN_BOTTOM have their obvious meaning). With proportional resize, a child may also be centered in the main orientation using wxALIGN_CENTER_VERTICAL (same as wxALIGN_CENTRE_VERTICAL) and wxALIGN_CENTER_HORIZONTAL (same as wxALIGN_CENTRE_HORIZONTAL) flags.

border

Determines the border width, if the *flag* parameter is set to any border.

userData

Allows an extra object to be attached to the sizer item, for use in derived classes when sizing information is more complex than the *option* and *flag* will allow for.

wxSizer::CalcMin

wxSize CalcMin()

This method is abstract and has to be overwritten by any derived class. Here, the sizer will do the actual calculation of its children minimal sizes.

wxSizer::Fit

void Fit(wxWindow* *window*)

Tell the sizer to resize the *window* to match the sizer's minimal size. This is commonly done in the constructor of the window itself, see sample in the description of *wxBoxSizer* (p. 77).

wxSizer::GetSize

wxSize GetSize()

Returns the current size of the sizer.

wxSizer::GetPosition

wxPoint GetPosition()

Returns the current position of the sizer.

wxSizer::GetMinSize

wxSize GetMinSize()

Returns the minimal size of the sizer. This is either the combined minimal size of all the children and their borders or the minimal size set by *SetMinSize* (p. 933), depending on which is bigger.

wxSizer::Layout

void Layout()

Call this to force layout of the children anew, e.g. after having added a child to or removed a child (window, other sizer or space) from the sizer while keeping the current dimension.

wxSizer::Prepend

void Prepend(**wxWindow*** *window*, **int** *option = 0*, **int** *flag = 0*, **int** *border = 0*, **wxObject*** *userData = NULL*)

void Prepend(**wxSizer*** *sizer*, **int** *option = 0*, **int** *flag = 0*, **int** *border = 0*, **wxObject*** *userData = NULL*)

void Prepend(**int** *width*, **int** *height*, **int** *option = 0*, **int** *flag = 0*, **int** *border= 0*, **wxObject*** *userData = NULL*)

Same as *wxSizer::Add* (p. 930), but prepends the items to the beginning of the list of items (windows, subsizers or spaces) owned by this sizer.

wxSizer::RecalcSizes

void RecalcSizes()

This method is abstract and has to be overwritten by any derived class. Here, the sizer

will do the actual calculation of its children's positions and sizes.

wxSizer::Remove

bool Remove(**wxWindow*** *window*)

bool Remove(**wxSizer*** *sizer*)

bool Remove(**int** *nth*)

Removes a child from the sizer. *window* is the window to be removed, *sizer* is the equivalent sizer and *nth* is the position of the child in the sizer, typically 0 for the first item. This method does not cause any layout or resizing to take place and does not delete the window itself. Call *wxSizer::Layout* (p. 932) to update the layout "on screen" after removing a child fom the sizer.

Returns TRUE if the child item was found and removed, FALSE otherwise.

wxSizer::SetDimension

void SetDimension(**int** *x*, **int** *y*, **int** *width*, **int** *height*)

Call this to force the sizer to take the given dimension and thus force the items owned by the sizer to resize themselves according to the rules defined by the paramater in the *Add* (p. 930) and *Prepend* (p. 932) methods.

wxSizer::SetMinSize

void SetMinSize(**int** *width*, **int** *height*)

void SetMinSize(**wxSize** *size*)

Call this to give the sizer a minimal size. Normally, the sizer will calculate its minimal size based purely on how much space its children need. After calling this method *GetMinSize* (p. 932) will return either the minimal size as requested by its children or the minimal size set here, depending on which is bigger.

wxSizer::SetItemMinSize

void SetItemMinSize(**wxWindow*** *window*, **int** *width*, **int** *height*)

void SetItemMinSize(**wxSizer*** *sizer*, **int** *width*, **int** *height*)

void SetItemMinSize(**int** *pos*, **int** *width*, **int** *height*)

Set an item's minimum size by window, sizer, or position. The item will be found

recursively in the sizer's descendants. This function enables an application to set the size of an item after initial creation.

wxSizer::SetSizeHints

void SetSizeHints(**wxWindow*** *window*)

Tell the sizer to set the minimal size of the *window* to match the sizer's minimal size. This is commonly done in the constructor of the window itself, see sample in the description of *wxBoxSizer* (p. 77) if the window is resizable (as are many dialogs under Unix and frames on probably all platforms).

wxSlider

A slider is a control with a handle which can be pulled back and forth to change the value.

In Windows versions below Windows 95, a scrollbar is used to simulate the slider. In Windows 95, the track bar control is used.

Slider events are handled in the same way as a scrollbar.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/slider.h>

Window styles

wxSL_HORIZONTAL	Displays the slider horizontally.
wxSL_VERTICAL	Displays the slider vertically.
wxSL_AUTOTICKS	Displays tick marks.
wxSL_LABELS	Displays minimum, maximum and value labels. (NB: only displays the current value label under wxGTK)
wxSL_LEFT	Displays ticks on the left, if a vertical slider.
wxSL_RIGHT	Displays ticks on the right, if a vertical slider.
wxSL_TOP	Displays ticks on the top, if a horizontal slider.
wxSL_SELRANGE	Allows the user to select a range on the slider. Windows 95 only.

See also *window styles overview* (p. 1379).

Event handling

To process input from a slider, use one of these event handler macros to direct input to member functions that take a *wxScrollEvent* (p. 914) argument:

EVT_COMMAND_SCROLL(id, func)   Catch all scroll commands.
EVT_COMMAND_TOP(id, func)   Catch a command to put the scroll thumb at the maximum position.
EVT_COMMAND_BOTTOM(id, func)   Catch a command to put the scroll thumb at the maximum position.
EVT_COMMAND_LINEUP(id, func)   Catch a line up command.
EVT_COMMAND_LINEDOWN(id, func) Catch a line down command.
EVT_COMMAND_PAGEUP(id, func)   Catch a page up command.
EVT_COMMAND_PAGEDOWN(id, func)   Catch a page down command.
EVT_COMMAND_THUMBTRACK(id, func)   Catch a thumbtrack command (continuous movement of the scroll thumb).
EVT_SLIDER(id, func)   Process a wxEVT_COMMAND_SLIDER_UPDATED event, when the slider is moved. Though provided for backward compatibility, this is obsolete.

See also

Event handling overview (p. 1372), *wxScrollBar* (p. 907)

wxSlider::wxSlider

wxSlider()

Default slider.

wxSlider(**wxWindow*** *parent*, **wxWindowID** *id*, **int** *value* , **int** *minValue*, **int** *maxValue*, **const wxPoint&** *point* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxSL_HORIZONTAL*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"slider"*)

Constructor, creating and showing a slider.

Parameters

parent
    Parent window. Must not be NULL.

id

Window identifier. A value of -1 indicates a default value.

value

Initial position for the slider.

minValue

Minimum slider position.

maxValue

Maximum slider position.

size

Window size. If the default size (-1, -1) is specified then a default size is chosen.

style

Window style. See *wxSlider* (p. 934).

validator

Window validator.

name

Window name.

See also

wxSlider::Create (p. 937), *wxValidator* (p. 1172)

wxSlider::~wxSlider

void ~wxSlider()

Destructor, destroying the slider.

wxSlider::ClearSel

void ClearSel()

Clears the selection, for a slider with the **wxSL_SELRANGE** style.

Remarks

Windows 95 only.

wxSlider::ClearTicks

void ClearTicks()

Clears the ticks.

Remarks

Windows 95 only.

wxSlider::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **int** *value* , **int** *minValue*, **int** *maxValue*, **const wxPoint&** *point = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxSL_HORIZONTAL*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "slider"*)

Used for two-step slider construction. See *wxSlider::wxSlider* (p. 935) for further details.

wxSlider::GetLineSize

int GetLineSize() **const**

Returns the line size.

See also

wxSlider::SetLineSize (p. 940)

wxSlider::GetMax

int GetMax() **const**

Gets the maximum slider value.

See also

wxSlider::GetMin (p. 937), *wxSlider::SetRange* (p. 939)

wxSlider::GetMin

int GetMin() **const**

Gets the minimum slider value.

See also

wxSlider::GetMin (p. 937), *wxSlider::SetRange* (p. 939)

wxSlider::GetPageSize

int GetPageSize() **const**

Returns the page size.

See also

wxSlider::SetPageSize (p. 940)

wxSlider::GetSelEnd

int GetSelEnd() **const**

Returns the selection end point.

Remarks

Windows 95 only.

See also

wxSlider::GetSelStart (p. 938), *wxSlider::SetSelection* (p. 941)

wxSlider::GetSelStart

int GetSelStart() **const**

Returns the selection start point.

Remarks

Windows 95 only.

See also

wxSlider::GetSelEnd (p. 938), *wxSlider::SetSelection* (p. 941)

wxSlider::GetThumbLength

int GetThumbLength() **const**

Returns the thumb length.

Remarks

Windows 95 only.

See also

wxSlider::SetThumbLength (p. 941)

wxSlider::GetTickFreq

int GetTickFreq() **const**

Returns the tick frequency.

Remarks

Windows 95 only.

See also

wxSlider::SetTickFreq (p. 939)

wxSlider::GetValue

int GetValue() **const**

Gets the current slider value.

See also

wxSlider::GetMin (p. 937), *wxSlider::GetMax* (p. 937), *wxSlider::SetValue* (p. 942)

wxSlider::SetRange

void SetRange(**int** *minValue*, **int** *maxValue*)

Sets the minimum and maximum slider values.

See also

wxSlider::GetMin (p. 937), *wxSlider::GetMax* (p. 937)

wxSlider::SetTickFreq

void SetTickFreq(**int** *n*, **int** *pos*)

Sets the tick mark frequency and position.

Parameters

n

Frequency. For example, if the frequency is set to two, a tick mark is displayed for every other increment in the slider's range.

pos

Position. Must be greater than zero. TODO: what is this for?

Remarks

Windows 95 only.

See also

wxSlider::GetTickFreq (p. 939)

wxSlider::SetLineSize

void SetLineSize(**int** *lineSize*)

Sets the line size for the slider.

Parameters

lineSize

The number of steps the slider moves when the user moves it up or down a line.

See also

wxSlider::GetLineSize (p. 937)

wxSlider::SetPageSize

void SetPageSize(**int** *pageSize*)

Sets the page size for the slider.

Parameters

pageSize

The number of steps the slider moves when the user pages up or down.

See also

wxSlider::GetPageSize (p. 938)

wxSlider::SetSelection

void SetSelection(**int** *startPos*, **int** *endPos*)

Sets the selection.

Parameters

startPos
      The selection start position.

endPos
      The selection end position.

Remarks

Windows 95 only.

See also

wxSlider::GetSelStart (p. 938), *wxSlider::GetSelEnd* (p. 938)

wxSlider::SetThumbLength

void SetThumbLength(**int** *len*)

Sets the slider thumb length.

Parameters

len
      The thumb length.

Remarks

Windows 95 only.

See also

wxSlider::GetThumbLength (p. 938)

wxSlider::SetTick

void SetTick(**int** *tickPos*)

Sets a tick position.

Parameters

tickPos
>   The tick position.

Remarks

Windows 95 only.

See also

wxSlider::SetTickFreq (p. 939)

wxSlider::SetValue

void SetValue(**int** *value*)

Sets the slider position.

Parameters

value
>   The slider position.

See also

wxSlider::GetValue (p. 939)

wxSockAddress

You are unlikely to need to use this class: only wxSocketBase uses it.

Derived from

wxObject (p. 750)

Include files

<wx/socket.h>

See also

wxSocketBase (p. 943)*wxIPV4address* (p. 599)

wxSockAddress::wxSockAddress

wxSockAddress()

Default constructor.

wxSockAddress::~wxSockAddress

~wxSockAddress()

Default destructor.

wxSockAddress::Clear

void Clear()

Delete all informations about the address.

wxSockAddress::SockAddrLen

int SockAddrLen()

Returns the length of the socket address.

wxSocketBase

wxSocketBase is the base class for all socket-related objects, and it defines all basic IO functionality.

Derived from

wxObject (p. 750)

Include files

<wx/socket.h>

wxSocket errors

wxSOCKET_NOERROR	No error happened.
wxSOCKET_INVOP	Invalid operation.
wxSOCKET_IOERR	Input/Output error.
wxSOCKET_INVADDR	Invalid address passed to wxSocket.

wxSOCKET_INVSOCK	Invalid socket (uninitialized).
wxSOCKET_NOHOST	No corresponding host.
wxSOCKET_INVPORT	Invalid port.
wxSOCKET_WOULDBLOCK	The socket is non-blocking and the operation would block.
wxSOCKET_TIMEDOUT	The timeout for this operation expired.
wxSOCKET_MEMERR	Memory exhausted.

wxSocket events

wxSOCKET_INPUT	There is data available for reading.
wxSOCKET_OUTPUT	The socket is ready to be written to.
wxSOCKET_CONNECTION	Incoming connection request (server), or successful connection establishment (client).
wxSOCKET_LOST	The connection has been closed.

A brief note on how to use these events:

The **wxSOCKET_INPUT** event will be issued whenever there is data available for reading. This will be the case if the input queue was empty and new data arrives, or if the application has read some data yet there is still more data available. This means that the application does not need to read all available data in response to a **wxSOCKET_INPUT** event, as more events will be produced as necessary.

The **wxSOCKET_OUTPUT** event is issued when a socket is first connected with *Connect* (p. 961) or accepted with *Accept* (p. 965). After that, new events will be generated only after an output operation fails with **wxSOCKET_WOULDBLOCK** and buffer space becomes available again. This means that the application should assume that it can write data to the socket until an **wxSOCKET_WOULDBLOCK** error occurs; after this, whenever the socket becomes writable again the application will be notified with another **wxSOCKET_OUTPUT** event.

The **wxSOCKET_CONNECTION** event is issued when a delayed connection request completes succesfully (client) or when a new connection arrives at the incoming queue (server).

The **wxSOCKET_LOST** event is issued when a close indication is received for the socket. This means that the connection broke down or that it was closed by the peer. Also, this event will be issued if a connection request fails.

Event handling

To process events coming from a socket object, use the following event handler macro to direct events to member functions that take a *wxSocketEvent* (p. 963) argument.

EVT_SOCKET(id, func)	Process a wxEVT_SOCKET event.

See also

wxSocketEvent (p. 963), *wxSocketClient* (p. 960), *wxSocketServer* (p. 964), *Sockets sample* (p. 1333)

Construction and destruction

wxSocketBase (p. 946)
~wxSocketBase (p. 946)
Destroy (p. 948)

Socket state

Functions to retrieve current state and miscellaneous info.

Error (p. 948)
GetLocal (p. 949)
GetPeer (p. 949) *IsConnected* (p. 950)
IsData (p. 950)
IsDisconnected (p. 950)
LastCount (p. 950)
LastError (p. 950)
Ok (p. 951)
SaveState (p. 951)
RestoreState (p. 951)

Basic IO

Functions that perform basic IO functionality.

Close (p. 948)
Discard (p. 948)
Peek (p. 954)
Read (p. 955)
ReadMsg (p. 955)
Unread (p. 956)
Write (p. 959)
WriteMsg (p. 960)

Functions that perform a timed wait on a certain IO condition.

InterruptWait (p. 949)
Wait (p. 957)
WaitForLost (p. 957)
WaitForRead (p. 958)
WaitForWrite (p. 959)

and also:

wxSocketServer::WaitForAccept (p. 966)
wxSocketClient::WaitOnConnect (p. 962)

Functions that allow applications to customize socket IO as needed.

GetFlags (p. 949)
SetFlags (p. 952)
SetTimeout (p. 954)

Handling socket events

Functions that allow applications to receive socket events.

Notify (p. 951)
SetNotify (p. 953)
GetClientData (p. 949)
SetClientData (p. 952)
SetEventHandler (p. 952)

Callback functions are also available, but they are provided for backwards compatibility only. Their use is strongly discouraged in favour of events, and should be considered deprecated. Callbacks may be unsupported in future releases of wxWindows.

Callback (p. 947)
CallbackData (p. 947)

wxSocketBase::wxSocketBase

wxSocketBase()

Default constructor. Don't use it directly; instead, use *wxSocketClient* (p. 960) to construct a socket client, or *wxSocketServer* (p. 964) to construct a socket server.

wxSocketBase::~wxSocketBase

~wxSocketBase()

Destructor. Do not destroy a socket using the delete operator directly; use *Destroy* (p. 948) instead. Also, do not create socket objects in the stack.

wxSocketBase::Callback

wxSocketBase::wxSockCbk Callback(**wxSocketBase::wxSockCbk** *callback*)

You can setup a callback function to be called when an event occurs. The function will be called only for those events for which notification has been enabled with *Notify* (p. 951) and *SetNotify* (p. 953). The prototype of the callback must be as follows:

```
void SocketCallback(wxSocketBase& sock, wxSocketNotify evt, char
*cdata);
```

The first parameter is a reference to the socket object in which the event occurred. The second parameter tells you which event occurred. (See *wxSocket events* (p. 943)). The third parameter is the user data you specified using *CallbackData* (p. 947).

Return value

A pointer to the previous callback.

Remark/Warning

Note that callbacks are now deprecated and unsupported, and they remain for backwards compatibility only. Use events instead.

See also

wxSocketBase::CallbackData (p. 947), *wxSocketBase::SetNotify* (p. 953), *wxSocketBase::Notify* (p. 951)

wxSocketBase::CallbackData

char * CallbackData(**char ****cdata*)

This function sets the the user data which will be passed to a callback function set via *Callback* (p. 947).

Return value

A pointer to the previous user data.

Remark/Warning

Note that callbacks are now deprecated and unsupported, and they remain for backwards compatibility only. Use events instead.

See also

wxSocketBase::Callback (p. 947), *wxSocketBase::SetNotify* (p. 953), *wxSocketBase::Notify* (p. 951)

wxSocketBase::Close

void Close()

This function shuts down the socket, disabling further transmission and reception of data; it also disables events for the socket and frees the associated system resources. Upon socket destruction, Close is automatically called, so in most cases you won't need to do it yourself, unless you explicitly want to shut down the socket, typically to notify the peer that you are closing the connection.

Remark/Warning

Although Close immediately disables events for the socket, it is possible that event messages may be waiting in the application's event queue. The application must therefore be prepared to handle socket event messages even after calling Close.

wxSocketBase::Destroy

bool Destroy()

Destroys the socket safely. Use this function instead of the delete operator, since otherwise socket events could reach the application even after the socket has been destroyed. To prevent this problem, this function appends the wxSocket to a list of object to be deleted on idle time, after all events have been processed. For the same reason, you should avoid creating socket objects in the stack.

Destroy calls *Close* (p. 948) automatically.

Return value

Always TRUE.

wxSocketBase::Discard

wxSocketBase& Discard()

This function simply deletes all bytes in the incoming queue. This function always returns immediately and its operation is not affected by IO flags.

Use *LastCount* (p. 950) to verify the number of bytes actually discarded.

If you use *Error* (p. 948), it will always return FALSE.

wxSocketBase::Error

bool Error() **const**

Returns TRUE if an error occurred in the last IO operation.

Use this function to check for an error condition after one of the following calls: Discard, Peek, Read, ReadMsg, Unread, Write, WriteMsg.

wxSocketBase::GetClientData

void * GetClientData() const

Returns a pointer of the client data for this socket, as set with *SetClientData* (p. 952)

wxSocketBase::GetLocal

bool GetLocal(wxSockAddress& *addr*) const

This function returns the local address field of the socket. The local address field contains the complete local address of the socket (local address, local port, ...).

Return value

TRUE if no error happened, FALSE otherwise.

wxSocketBase::GetFlags

wxSocketFlags GetFlags() const

Returns current IO flags, as set with *SetFlags* (p. 952)

wxSocketBase::GetPeer

bool GetPeer(wxSockAddress& *addr*) const

This function returns the peer address field of the socket. The peer address field contains the complete peer host address of the socket (address, port, ...).

Return value

TRUE if no error happened, FALSE otherwise.

wxSocketBase::InterruptWait

void InterruptWait()

Use this function to interrupt any wait operation currently in progress. Note that this is

not intended as a regular way to interrupt a Wait call, but only as an escape mechanism for exceptional situations where it is absolutely necessary to use it, for example to abort an operation due to some exception or abnormal problem. InterruptWait is automatically called when you *Close* (p. 948) a socket (and thus also upon socket destruction), so you don't need to use it in these cases.

wxSocketBase::Wait (p. 957), *wxSocketServer::WaitForAccept* (p. 966), *wxSocketBase::WaitForLost* (p. 957), *wxSocketBase::WaitForRead* (p. 958), *wxSocketBase::WaitForWrite* (p. 959), *wxSocketClient::WaitOnConnect* (p. 962)

wxSocketBase::IsConnected

bool IsConnected() **const**

Returns TRUE if the socket is connected.

wxSocketBase::IsData

bool IsData() **const**

This function waits until the socket is readable. This might mean that queued data is available for reading or, for streamed sockets, that the connection has been closed, so that a read operation will complete immediately without blocking (unless the **wxSOCKET_WAITALL** flag is set, in which case the operation might still block).

wxSocketBase::IsDisconnected

bool IsDisconnected() **const**

Returns TRUE if the socket is not connected.

wxSocketBase::LastCount

wxUint32 LastCount() **const**

Returns the number of bytes read or written by the last IO call.

Use this function to get the number of bytes actually transferred after using one of the following IO calls: Discard, Peek, Read, ReadMsg, Unread, Write, WriteMsg.

wxSocketBase::LastError

wxSocketError LastError() **const**

Returns the last wxSocket error. See *wxSocket errors* (p. 943).

Please note that this function merely returns the last error code, but it should not be used to determine if an error has occurred (this is because successful operations do not change the LastError value). Use *Error* (p. 948) first, in order to determine if the last IO call failed. If this returns TRUE, use LastError to discover the cause of the error.

wxSocketBase::Notify

void Notify(**bool** *notify*)

According to the *notify* value, this function enables or disables socket events. If *notify* is TRUE, the events configured with *SetNotify* (p. 953) will be sent to the application. If *notify* is FALSE; no events will be sent.

wxSocketBase::Ok

bool Ok() **const**

Returns TRUE if the socket is initialized and ready and FALSE in other cases.

Remark/Warning

For *wxSocketClient* (p. 960), Ok won't return TRUE unless the client is connected to a server.

For *wxSocketServer* (p. 964), Ok will return TRUE if the server could bind to the specified address and is already listening for new connections.

Ok does not check for IO errors; use *Error* (p. 948) instead for that purpose.

wxSocketBase::RestoreState

void RestoreState()

This function restores the previous state of the socket, as saved with *SaveState* (p. 951)

Calls to SaveState and RestoreState can be nested.

See also

wxSocketBase::SaveState (p. 951)

wxSocketBase::SaveState

void SaveState()

This function saves the current state of the socket in a stack. Socket state includes flags, as set with *SetFlags* (p. 952), event mask, as set with *SetNotify* (p. 953) and *Notify* (p. 951), user data, as set with *SetClientData* (p. 952), and asynchronous callback settings, as set with *Callback* (p. 947) and *CallbackData* (p. 947).

Calls to SaveState and RestoreState can be nested.

See also

wxSocketBase::RestoreState (p. 951)

wxSocketBase::SetClientData

void SetClientData(void * *data*)

Sets user-supplied client data for this socket. All socket events will contain a pointer to this data, which can be retrieved with the *wxSocketEvent::GetClientData* (p. 964) function.

wxSocketBase::SetEventHandler

void SetEventHandler(wxEvtHandler& *handler*, int *id = -1*)

Sets an event handler to be called when a socket event occurs. The handler will be called for those events for which notification is enabled with *SetNotify* (p. 953) and *Notify* (p. 951).

Parameters

handler
      Specifies the event handler you want to use.

id
      The id of socket event.

See also

wxSocketBase::SetNotify (p. 953), *wxSocketBase::Notify* (p. 951), *wxSocketEvent* (p. 963), *wxEvtHandler* (p. 380)

wxSocketBase::SetFlags

void SetFlags(wxSocketFlags *flags*)

Use SetFlags to customize IO operation for this socket. The *flags* parameter may be a combination of flags ORed toghether. The following flags can be used:

wxSOCKET_NONE	Normal functionality.
wxSOCKET_NOWAIT	Read/write as much data as possible and return immediately.
wxSOCKET_WAITALL	Wait for all required data to be read/written unless an error occurs.
wxSOCKET_BLOCK	Block the GUI (do not yield) while reading/writing data.

A brief overview on how to use these flags follows.

If no flag is specified (this is the same as **wxSOCKET_NONE**), IO calls will return after some data has been read or written, even when the transfer might not be complete. This is the same as issuing exactly one blocking low-level call to recv() or send(). Note that *blocking* here refers to when the function returns, not to whether the GUI blocks during this time.

If **wxSOCKET_NOWAIT** is specified, IO calls will return immediately. Read operations will retrieve only available data. Write operations will write as much data as possible, depending on how much space is available in the output buffer. This is the same as issuing exactly one nonblocking low-level call to recv() or send(). Note that *nonblocking* here refers to when the function returns, not to whether the GUI blocks during this time.

If **wxSOCKET_WAITALL** is specified, IO calls won't return until ALL the data has been read or written (or until an error occurs), blocking if necessary, and issuing several low level calls if necessary. This is the same as having a loop which makes as many blocking low-level calls to recv() or send() as needed so as to transfer all the data. Note that *blocking* here refers to when the function returns, not to whether the GUI blocks during this time.

The **wxSOCKET_BLOCK** flag controls whether the GUI blocks during IO operations. If this flag is specified, the socket will not yield during IO calls, so the GUI will remain blocked until the operation completes. If it is not used, then the application must take extra care to avoid unwanted reentrance.

So:

wxSOCKET_NONE will try to read at least SOME data, no matter how much.

wxSOCKET_NOWAIT will always return immediately, even if it cannot read or write ANY data.

wxSOCKET_WAITALL will only return when it has read or written ALL the data.

wxSOCKET_BLOCK has nothing to do with the previous flags and it controls whether the GUI blocks.

wxSocketBase::SetNotify

void SetNotify(**wxSocketEventFlags** *flags*)

SetNotify specifies which socket events are to be sent to the event handler. The *flags* parameter may be combination of flags ORed toghether. The following flags can be used:

wxSOCKET_INPUT_FLAG   to receive wxSOCKET_INPUT
wxSOCKET_OUTPUT_FLAG   to receive wxSOCKET_OUTPUT
wxSOCKET_CONNECTION_FLAG   to receive wxSOCKET_CONNECTION
wxSOCKET_LOST_FLAG   to receive wxSOCKET_LOST

For example:

```
sock.SetNotify(wxSOCKET_INPUT_FLAG | wxSOCKET_LOST_FLAG);
sock.Notify(TRUE);
```

In this example, the user will be notified about incoming socket data and whenever the connection is closed.

For more information on socket events see *wxSocket events* (p. 943).

wxSocketBase::SetTimeout

void SetTimeout(**int** *seconds*)

This function sets the default socket timeout in seconds. This timeout applies to all IO calls, and also to the *Wait* (p. 957) family of functions if you don't specify a wait interval. Initially, the default timeout is 10 minutes.

wxSocketBase::Peek

wxSocketBase& Peek(**void** * *buffer*, **wxUint32** *nbytes*)

This function peeks a buffer of *nbytes* bytes from the socket. Peeking a buffer doesn't delete it from the socket input queue.

Use *LastCount* (p. 950) to verify the number of bytes actually peeked.

Use *Error* (p. 948) to determine if the operation succeeded.

Parameters

buffer
    Buffer where to put peeked data.

nbytes
    Number of bytes.

Return value

Returns a reference to the current object.

Remark/Warning

The exact behaviour of wxSocketBase::Peek depends on the combination of flags being used. For a detailed explanation, see *wxSocketBase::SetFlags* (p. 952)

See also

wxSocketBase::Error (p. 948), *wxSocketBase::LastError* (p. 950), *wxSocketBase::LastCount* (p. 950), *wxSocketBase::SetFlags* (p. 952)

wxSocketBase::Read

wxSocketBase& Read(**void** * *buffer*, **wxUint32** *nbytes*)

This function reads a buffer of *nbytes* bytes from the socket.

Use *LastCount* (p. 950) to verify the number of bytes actually read.

Use *Error* (p. 948) to determine if the operation succeeded.

Parameters

buffer
    Buffer where to put read data.

nbytes
    Number of bytes.

Return value

Returns a reference to the current object.

Remark/Warning

The exact behaviour of wxSocketBase::Read depends on the combination of flags being used. For a detailed explanation, see *wxSocketBase::SetFlags* (p. 952).

See also

wxSocketBase::Error (p. 948), *wxSocketBase::LastError* (p. 950), *wxSocketBase::LastCount* (p. 950), *wxSocketBase::SetFlags* (p. 952)

wxSocketBase::ReadMsg

wxSocketBase& ReadMsg(**void** * *buffer*, **wxUint32** *nbytes*)

This function reads a buffer sent by *WriteMsg* (p. 960) on a socket. If the buffer passed to the function isn't big enough, the remaining bytes will be discarded. This function always waits for the buffer to be entirely filled, unless an error occurs.

Use *LastCount* (p. 950) to verify the number of bytes actually read.

Use *Error* (p. 948) to determine if the operation succeeded.

Parameters

buffer
    Buffer where to put read data.

nbytes
    Size of the buffer.

Return value

Returns a reference to the current object.

Remark/Warning

wxSocketBase::ReadMsg will behave as if the **wxSOCKET_WAITALL** flag was always set and it will always ignore the **wxSOCKET_NOWAIT** flag. The exact behaviour of ReadMsg depends on the **wxSOCKET_BLOCK** flag. For a detailed explanation, see *wxSocketBase::SetFlags* (p. 952).

See also

wxSocketBase::Error (p. 948), *wxSocketBase::LastError* (p. 950), *wxSocketBase::LastCount* (p. 950), *wxSocketBase::SetFlags* (p. 952), *wxSocketBase::WriteMsg* (p. 960)

wxSocketBase::Unread

wxSocketBase& Unread(**const void *** *buffer*, **wxUint32** *nbytes*)

This function unreads a buffer. That is, the data in the buffer is put back in the incoming queue. This function is not affected by wxSocket flags.

If you use *LastCount* (p. 950), it will always return *nbytes*.

If you use *Error* (p. 948), it will always return FALSE.

Parameters

buffer
    Buffer to be unread.

nbytes
> Number of bytes.

Return value

Returns a reference to the current object.

See also

wxSocketBase::Error (p. 948), *wxSocketBase::LastCount* (p. 950),
wxSocketBase::LastError (p. 950)

wxSocketBase::Wait

bool Wait(**long** *seconds = -1*, **long** *millisecond = 0*)

This function waits until any of the following conditions is TRUE:
- The socket becomes readable.
- The socket becomes writable.
- An ongoing connection request has completed (*wxSocketClient* (p. 960) only)
- An incoming connection request has arrived (*wxSocketServer* (p. 964) only)
- The connection has been closed.

Note that it is recommended to use the individual Wait functions to wait for the required condition, instead of this one.

Parameters

seconds
> Number of seconds to wait. If -1, it will wait for the default timeout, as set with *SetTimeout* (p. 954).

millisecond
> Number of milliseconds to wait.

Return value

Returns TRUE when any of the above conditions is satisfied, FALSE if the timeout was reached.

See also

wxSocketBase::InterruptWait (p. 949), *wxSocketServer::WaitForAccept* (p. 966),
wxSocketBase::WaitForLost (p. 957), *wxSocketBase::WaitForRead* (p. 958),
wxSocketBase::WaitForWrite (p. 959), *wxSocketClient::WaitOnConnect* (p. 962)

wxSocketBase::WaitForLost

bool Wait(**long** *seconds = -1*, **long** *millisecond = 0*)

This function waits until the connection is lost. This may happen if the peer gracefully closes the connection or if the connection breaks.

Parameters

seconds
  Number of seconds to wait. If -1, it will wait for the default timeout, as set with *SetTimeout* (p. 954).

millisecond
  Number of milliseconds to wait.

Return value

Returns TRUE if the connection was lost, FALSE if the timeout was reached.

See also

wxSocketBase::InterruptWait (p. 949), *wxSocketBase::Wait* (p. 957)

wxSocketBase::WaitForRead

bool WaitForRead(**long** *seconds = -1*, **long** *millisecond = 0*)

This function waits until the socket is readable. This might mean that queued data is available for reading or, for streamed sockets, that the connection has been closed, so that a read operation will complete immediately without blocking (unless the **wxSOCKET_WAITALL** flag is set, in which case the operation might still block).

Parameters

seconds
  Number of seconds to wait. If -1, it will wait for the default timeout, as set with *SetTimeout* (p. 954).

millisecond
  Number of milliseconds to wait.

Return value

Returns TRUE if the socket becomes readable, FALSE on timeout.

See also

wxSocketBase::InterruptWait (p. 949), *wxSocketBase::Wait* (p. 957)

wxSocketBase::WaitForWrite

bool WaitForWrite(**long** *seconds = -1*, **long** *millisecond = 0*)

This function waits until the socket becomes writable. This might mean that the socket is ready to send new data, or for streamed sockets, that the connection has been closed, so that a write operation is guaranteed to complete immediately (unless the **wxSOCKET_WAITALL** flag is set, in which case the operation might still block).

Parameters

seconds
> Number of seconds to wait. If -1, it will wait for the default timeout, as set with *SetTimeout* (p. 954).

millisecond
> Number of milliseconds to wait.

Return value

Returns TRUE if the socket becomes writable, FALSE on timeout.

See also

wxSocketBase::InterruptWait (p. 949), *wxSocketBase::Wait* (p. 957)

wxSocketBase::Write

wxSocketBase& Write(**const void *** *buffer*, **wxUint32** *nbytes*)

This function writes a buffer of *nbytes* bytes to the socket.

Use *LastCount* (p. 950) to verify the number of bytes actually written.

Use *Error* (p. 948) to determine if the operation succeeded.

Parameters

buffer
> Buffer with the data to be sent.

nbytes
> Number of bytes.

Return value

Returns a reference to the current object.

Remark/Warning

The exact behaviour of wxSocketBase::Write depends on the combination of flags being used. For a detailed explanation, see *wxSocketBase::SetFlags* (p. 952).

See also

wxSocketBase::Error (p. 948), *wxSocketBase::LastError* (p. 950),
wxSocketBase::LastCount (p. 950), *wxSocketBase::SetFlags* (p. 952)

wxSocketBase::WriteMsg

wxSocketBase& WriteMsg(**const void *** *buffer*, **wxUint32** *nbytes*)

This function writes a buffer of *nbytes* bytes from the socket, but it writes a short header before so that *ReadMsg* (p. 955) knows how much data should it actually read. So, a buffer sent with WriteMsg **must** be read with ReadMsg. This function always waits for the entire buffer to be sent, unless an error occurs.

Use *LastCount* (p. 950) to verify the number of bytes actually written.

Use *Error* (p. 948) to determine if the operation succeeded.

Parameters

buffer
    Buffer with the data to be sent.

nbytes
    Number of bytes to send.

Return value

Returns a reference to the current object.

Remark/Warning

wxSocketBase::WriteMsg will behave as if the **wxSOCKET_WAITALL** flag was always set and it will always ignore the **wxSOCKET_NOWAIT** flag. The exact behaviour of WriteMsg depends on the **wxSOCKET_BLOCK** flag. For a detailed explanation, see *wxSocketBase::SetFlags* (p. 952).

See also

wxSocketBase::Error (p. 948), *wxSocketBase::LastError* (p. 950),
wxSocketBase::LastCount (p. 950), *wxSocketBase::SetFlags* (p. 952),
wxSocketBase::ReadMsg (p. 955)

wxSocketClient

Derived from

wxSocketBase (p. 943)

Include files

<wx/socket.h>

wxSocketClient::wxSocketClient

wxSocketClient(**wxSocketFlags** *flags = wxSOCKET_NONE*)

Constructor.

Parameters

flags
    Socket flags (See *wxSocketBase::SetFlags* (p. 952))

wxSocketClient::~wxSocketClient

~wxSocketClient()

Destructor. Please see *wxSocketBase::Destroy* (p. 948).

wxSocketClient::Connect

bool Connect(**wxSockAddress&** *address*, **bool** *wait = TRUE*)

Connects to a server using the specified address.

If *wait* is TRUE, Connect will wait until the connection completes. **Warning:** This will block the GUI.

If *wait* is FALSE, Connect will try to establish the connection and return immediately, without blocking the GUI. When used this way, even if Connect returns FALSE, the connection request can be completed later. To detect this, use *WaitOnConnect* (p. 962), or catch **wxSOCKET_CONNECTION** events (for successful establishment) and **wxSOCKET_LOST** events (for connection failure).

Parameters

address
    Address of the server.

wait
>   If TRUE, waits for the connection to complete.

Return value

Returns TRUE if the connection is established and no error occurs.

If *wait* was TRUE, and Connect returns FALSE, an error occurred and the connection failed.

If *wait* was FALSE, and Connect returns FALSE, you should still be prepared to handle the completion of this connection request, either with *WaitOnConnect* (p. 962) or by watching **wxSOCKET_CONNECTION** and **wxSOCKET_LOST** events.

See also

wxSocketClient::WaitOnConnect (p. 962), *wxSocketBase::SetNotify* (p. 953), *wxSocketBase::Notify* (p. 951)

wxSocketClient::WaitOnConnect

bool WaitOnConnect(**long** *seconds = -1*, **long** *milliseconds = 0*)

Wait until a connection request completes, or until the specified timeout elapses. Use this function after issuing a call to *Connect* (p. 961) with *wait* set to FALSE.

Parameters

seconds
>   Number of seconds to wait. If -1, it will wait for the default timeout, as set with *SetTimeout* (p. 954).

millisecond
>   Number of milliseconds to wait.

Return value

WaitOnConnect returns TRUE if the connection request completes. This does not necessarily mean that the connection was succesfully established; it might also happen that the connection was refused by the peer. Use *IsConnected* (p. 950) to distinguish between these two situations.

If the timeout elapses, WaitOnConnect returns FALSE.

These semantics allow code like this:

```
// Issue the connection request
client->Connect(addr, FALSE);
```

```
// Wait until the request completes or until we decide to give up
bool waitmore = TRUE;
while ( !client->WaitOnConnect(seconds, millis) && waitmore )
{
    // possibly give some feedback to the user,
    // and update waitmore as needed.
}
bool success = client->IsConnected();
```

See also

wxSocketClient::Connect (p. 961), *wxSocketBase::InterruptWait* (p. 949),
wxSocketBase::IsConnected (p. 950)

wxSocketEvent

This event class contains information about socket events.

Derived from

wxEvent (p. 377)

Include files

<wx/socket.h>

Event table macros

To process a socket event, use these event handler macros to direct input to member
functions that take a wxSocketEvent argument.

EVT_SOCKET(id, func)	Process a socket event, supplying the member function.

See also

wxSocketBase (p. 943), *wxSocketClient* (p. 960), *wxSocketServer* (p. 964)

wxSocketEvent::wxSocketEvent

wxSocketEvent(**int** *id* = *0*)

Constructor.

wxSocketEvent::GetClientData

void * GetClientData()

Gets the client data of the socket which generated this event, as set with
wxSocketBase::SetClientData (p. 952).

wxSocketEvent::GetSocket

wxSocketBase * GetSocket() **const**

Returns the socket object to which this event refers to. This makes it possible to use the
same event handler for different sockets.

wxSocketEvent::GetSocketEvent

wxSocketNotify GetSocketEvent() **const**

Returns the socket event type.

wxSocketServer

Derived from

wxSocketBase (p. 943)

Include files

<wx/socket.h>

wxSocketServer::wxSocketServer

 wxSocketServer(**wxSockAddress&** *address,* **wxSocketFlags** *flags =
wxSOCKET_NONE*)

Constructs a new server and tries to bind to the specified *address*. Before trying to
accept new connections, test whether it succeeded with *wxSocketBase::Ok* (p. 951).

Parameters

address
>	Specifies the local address for the server (e.g. port number).

flags
>	Socket flags (See *wxSocketBase::SetFlags* (p. 952))

wxSocketServer::~wxSocketServer

~wxSocketServer()

Destructor (it doesn't close the accepted connections).

wxSocketServer::Accept

wxSocketBase * Accept(**bool** *wait = TRUE*)

Accepts an incoming connection request, and creates a new *wxSocketBase* (p. 943) object which represents the server-side of the connection.

If *wait* is TRUE and there are no pending connections to be accepted, it will wait for the next incoming connection to arrive. **Warning:** This will block the GUI.

If *wait* is FALSE, it will try to accept a pending connection if there is one, but it will always return immediately without blocking the GUI. If you want to use Accept in this way, you can either check for incoming connections with *WaitForAccept* (p. 966) or catch **wxSOCKET_CONNECTION** events, then call Accept once you know that there is an incoming connection waiting to be accepted.

Return value

Returns an opened socket connection, or NULL if an error occurred or if the *wait* parameter was FALSE and there were no pending connections.

See also

wxSocketServer::WaitForAccept (p. 966), *wxSocketBase::SetNotify* (p. 953), *wxSocketBase::Notify* (p. 951), *wxSocketServer::AcceptWith* (p. 965)

wxSocketServer::AcceptWith

bool AcceptWith(**wxSocketBase&** *socket*, **bool** *wait = TRUE*)

Accept an incoming connection using the specified socket object.

Parameters

socket

Socket to be initialized

Return value

Returns TRUE on success, or FALSE if an error occurred or if the *wait* parameter was FALSE and there were no pending connections.

wxSocketServer::WaitForAccept (p. 966), *wxSocketBase::SetNotify* (p. 953), *wxSocketBase::Notify* (p. 951), *wxSocketServer::Accept* (p. 965)

wxSocketServer::WaitForAccept

bool WaitForAccept(**long** *seconds = -1*, **long** *millisecond = 0*)

This function waits for an incoming connection. Use it if you want to call *Accept* (p. 965) or *AcceptWith* (p. 965) with *wait* set to FALSE, to detect when an incoming connection is waiting to be accepted.

Parameters

seconds
     Number of seconds to wait. If -1, it will wait for the default timeout, as set with *SetTimeout* (p. 954).

millisecond
     Number of milliseconds to wait.

Return value

Returns TRUE if an incoming connection arrived, FALSE if the timeout elapsed.

See also

wxSocketServer::Accept (p. 965), *wxSocketServer::AcceptWith* (p. 965),*wxSocketBase::InterruptWait* (p. 949)

wxSocketInputStream

This class implements an input stream which reads data from a connected socket. Note that this stream is purely sequential and it does not support seeking.

Derived from

wxInputStream (p. 595)

Include files

<wx/sckstrm.h>

See also

wxSocketBase (p. 943)

wxSocketInputStream::wxSocketInputStream

wxSocketInputStream(**wxSocketBase&** *s*)

Creates a new read-only socket stream using the specified initialized socket connection.

wxSocketOutputStream

This class implements an output stream which writes data from a connected socket. Note that this stream is purely sequential and it does not support seeking.

Derived from

wxOutputStream (p. 755)

Include files

<wx/sckstrm.h>

See also

wxSocketBase (p. 943)

wxSocketOutputStream::wxSocketOutputStream

wxSocketInputStream(**wxSocketBase&** *s*)

Creates a new write-only socket stream using the specified initialized socket connection.

wxSpinButton

A wxSpinButton has two small up and down (or left and right) arrow buttons. It is often used next to a text control for increment and decrementing a value. Portable programs should try to use *wxSpinCtrl* (p. 971) instead as wxSpinButton is not implemented for all platforms (Win32 and GTK only currently).

NB: the range supported by this control (and wxSpinCtrl) depends on the platform but is at least SHRT_MIN to SHRT_MAX.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

See also

wxSpinCtrl (p. 971)

Include files

<wx/spinbutt.h>

Window styles

wxSP_HORIZONTAL	Specifies a horizontal spin button (note that this style is not supported in wxGTK).
wxSP_VERTICAL	Specifies a vertical spin button.
wxSP_ARROW_KEYS	The user can use arrow keys.
wxSP_WRAP	The value wraps at the minimum and maximum.

See also *window styles overview* (p. 1379).

Event handling

To process input from a spin button, use one of these event handler macros to direct input to member functions that take a *wxSpinEvent* (p. 974) argument:

EVT_SPIN(id, func)	Generated whenever an arros is pressed.
EVT_SPIN_UP(id, func)	Generated when left/up arrow is pressed.
EVT_SPIN_DOWN(id, func)	Generated when right/down arrow is pressed.

See also

Event handling overview (p. 1372)

wxSpinButton::wxSpinButton

wxSpinButton()

Default constructor.

wxSpinButton(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxSP_HORIZONTAL*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "spinButton"*)

Constructor, creating and showing a spin button.

Parameters

parent
> Parent window. Must not be NULL.

id
> Window identifier. A value of -1 indicates a default value.

pos
> Window position. If the position (-1, -1) is specified then a default position is chosen.

size
> Window size. If the default size (-1, -1) is specified then a default size is chosen.

style
> Window style. See *wxSpinButton* (p. 967).

validator
> Window validator.

name
> Window name.

See also

wxSpinButton::Create (p. 970), *wxValidator* (p. 1172)

wxSpinButton::~wxSpinButton

void ~wxSpinButton()

Destructor, destroying the spin button.

wxSpinButton::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* =
wxDefaultPosition, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* =
wxSP_HORIZONTAL, **const wxValidator&** *validator* = *wxDefaultValidator*, **const
wxString&** *name* = *"spinButton"*)

Scrollbar creation function called by the spin button constructor. See
wxSpinButton::wxSpinButton (p. 969) for details.

wxSpinButton::GetMax

int GetMax() **const**

Returns the maximum permissible value.

See also

wxSpinButton::SetRange (p. 970)

wxSpinButton::GetMin

int GetMin() **const**

Returns the minimum permissible value.

See also

wxSpinButton::SetRange (p. 970)

wxSpinButton::GetValue

int GetValue() **const**

Returns the current spin button value.

See also

wxSpinButton::SetValue (p. 971)

wxSpinButton::SetRange

void SetRange(**int** *min*, **int** *max*)

Sets the range of the spin button.

Parameters

min
> The minimum value for the spin button.

max
> The maximum value for the spin button.

See also

wxSpinButton::GetMin (p. 970), *wxSpinButton::GetMax* (p. 970)

wxSpinButton::SetValue

void SetValue(**int** *value*)

Sets the value of the spin button.

Parameters

value
> The value for the spin button.

See also

wxSpinButton::GetValue (p. 970)

wxSpinCtrl

wxSpinCtrl combines *wxTextCtrl* (p. 1075) and *wxSpinButton* (p. 967) in one control.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/spinctrl.h>

Window styles

wxSP_ARROW_KEYS	The user can use arrow keys.
wxSP_WRAP	The value wraps at the minimum and maximum.

Event handling

To process input from a spin button, use one of these event handler macros to direct input to member functions that take a *wxSpinEvent* (p. 974) argument:

EVT_SPINCTRL(id, func)   Generated whenever spinctrl is updated

See also

Event handling overview (p. 1372), *wxSpinButton* (p. 967), *wxControl* (p. 177)

wxSpinCtrl::wxSpinCtrl

wxSpinCtrl()

Default constructor.

wxSpinCtrl(**wxWindow*** *parent*, **wxWindowID** *id = -1*, **const wxString&** *value = wxEmptyString*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxSP_ARROW_KEYS*, **int** *min = 0*, **int** *max = 100*, **int** *initial = 0*, **const wxString&** *name = _T("wxSpinCtrl")*)

Constructor, creating and showing a spin control.

Parameters

parent
      Parent window. Must not be NULL.

value
      Default value.

id
      Window identifier. A value of -1 indicates a default value.

pos
      Window position. If the position (-1, -1) is specified then a default position is chosen.

size
      Window size. If the default size (-1, -1) is specified then a default size is chosen.

style
      Window style. See *wxSpinButton* (p. 967).

min
    Minimal value.

max
    Maximal value.

initial
    Initial value.

name
    Window name.

See also

wxSpinCtrl::Create (p. 973)

wxSpinCtrl::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id = -1*, **const wxString&** *value = wxEmptyString*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxSP_ARROW_KEYS*, **int** *min = 0*, **int** *max = 100*, **int** *initial = 0*, **const wxString&** *name = _T("wxSpinCtrl")*)

Creation function called by the spin control constructor.

See *wxSpinCtrl::wxSpinCtrl* (p. 972) for details.

wxSpinCtrl::SetValue

void SetValue(**const wxString&** *text*)

void SetValue(**int** *value*)

Sets the value of the spin control.

wxSpinCtrl::GetValue

int GetValue() **const**

Gets the value of the spin control.

wxSpinCtrl::SetRange

void SetRange(**int** *minVal*, **int** *maxVal*)

Sets range of allowable values.

wxSpinCtrl::GetMin

int GetMin() **const**

Gets minimal allowable value.

wxSpinCtrl::GetMax

int GetMax() **const**

Gets maximal allowable value.

wxSpinEvent

This event class is used for the events generated by *wxSpinButton* (p. 967) and *wxSpinCtrl* (p. 971).

Derived from

wxNotifyEvent (p. 749)
wxCommandEvent (p. 153)
wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/spinbutt.h> or <wx/spinctrl.h>

See also

wxSpinButton (p. 967) and *wxSpinCtrl* (p. 971)

wxSpinEvent::wxSpinEvent

wxSpinEvent(**wxEventType** *commandType = wxEVT_NULL*, **int** *id = 0*)

The constructor is not normally used by the user code.

wxSpinEvent::GetPosition

int GetPosition() **const**

Retrieve the current spin button or control value.

wxSpinEvent::SetPosition

void SetPosition(**int** *pos*)

Set the value associated with the event.

wxSplitterEvent

This class represents the events generated by a splitter control. Also there is only one event class, the data associated to the different events is not the same and so not all accessor functions may be called for each event. The documentation mentions the kind of event(s) for which the given acessor function makes sense: calling it for other types of events will result in assert failure (in debug mode) and will return meaningless results.

Derived from

wxCommandEvent (p. 153)
wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/splitter.h>

Event table macros

To process a splitter event, use these event handler macros to direct input to member functions that take a wxSplitterEvent argument.

EVT_SPLITTER_SASH_POS_CHANGING(id, func)	The sash position is in the process of being changed. May be used to modify the position of the tracking bar to properly reflect the position that would be set if the drag were to be completed at this point. Processes a wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGING event.
EVT_SPLITTER_SASH_POS_CHANGED(id, func)	The sash position was

changed. May be used to modify the sash position before it is set, or to prevent the change from taking place. Processes a wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGED event.

EVT_SPLITTER_UNSPLIT(id, func)   The splitter has been just unsplit. Processes a wxEVT_COMMAND_SPLITTER_UNSPLIT event.

EVT_SPLITTER_DOUBLECLICKED(id, func)   The sash was double clicked. The default behaviour is to unsplit the window when this happens (unless the minimum pane size has been set to a value greater than zero). Processes a wxEVT_COMMAND_SPLITTER_DOUBLECLICKED event.

See also

wxSplitterWindow (p. 978), *Event handling overview* (p. 1372)

wxSplitterEvent::wxSplitterEvent

 wxSplitterEvent(**wxEventType** *eventType = wxEVT_NULL*, **wxSplitterWindow** * *splitter = NULL*)

Constructor. Used internally by wxWindows only.

wxSplitterEvent::GetSashPosition

int GetSashPosition() **const**

Returns the new sash position.

May only be called while processing wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGING and wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGED events.

wxSplitterEvent::GetX

int GetX() const

Returns the x coordinate of the double-click point.

May only be called while processing wxEVT_COMMAND_SPLITTER_DOUBLECLICKED events.

wxSplitterEvent::GetY

int GetY() const

Returns the y coordinate of the double-click point.

May only be called while processing wxEVT_COMMAND_SPLITTER_DOUBLECLICKED events.

wxSplitterEvent::GetWindowBeingRemoved

wxWindow* GetWindowBeingRemoved() const

Returns a pointer to the window being removed when a splitter window is unsplit.

May only be called while processing wxEVT_COMMAND_SPLITTER_UNSPLIT events.

wxSplitterEvent::SetSashPosition

void SetSashPosition(int*pos*)

In the case of wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGED events, sets the the new sash position. In the case of wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGING events, sets the new tracking bar position so visual feedback during dragging will represent that change that will actually take place. Set to -1 from the event handler code to prevent repositioning.

May only be called while processing wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGING and wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGED events.

Parameters

pos
    New sash position.

wxSplitterWindow

wxSplitterWindow overview (p. 1403)

This class manages up to two subwindows. The current view can be split into two programmatically (perhaps from a menu command), and unsplit either programmatically or via the wxSplitterWindow user interface.

Appropriate 3D shading for the Windows 95 user interface is an option. This is also recommended for GTK.

Window styles

wxSP_3D	Draws a 3D effect border and sash.
wxSP_3DSASH	Draws a 3D effect sash.
wxSP_3DBORDER	Draws a 3D effect border.
wxSP_FULLSASH	Draws the ends of the sash (so the window can be used without a border).
wxSP_BORDER	Draws a thin black border around the window.
wxSP_NOBORDER	No border, and a black sash.
wxSP_PERMIT_UNSPLIT	Always allow to unsplit, even with the minimum pane size other than zero.
wxSP_LIVE_UPDATE	Don't draw XOR line but resize the child windows immediately.

See also *window styles overview* (p. 1379).

Derived from

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/splitter.h>

Event handling

To process input from a splitter control, use the following event handler macros to direct input to member functions that take a *wxSplitterEvent* (p. 975) argument.

EVT_SPLITTER_SASH_POS_CHANGING(id, func)   The sash position is in the

	process of being changed. May be used to modify the position of the tracking bar to properly reflect the position that would be set if the drag were to be completed at this point. Processes a wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGING event.
EVT_SPLITTER_SASH_POS_CHANGED(id, func)	The sash position was changed. May be used to modify the sash position before it is set, or to prevent the change from taking place. Processes a wxEVT_COMMAND_SPLITTER_SASH_POS_CHANGED event.
EVT_SPLITTER_UNSPLIT(id, func)	The splitter has been just unsplit. Processes a wxEVT_COMMAND_SPLITTER_UNSPLIT event.
EVT_SPLITTER_DOUBLECLICKED(id, func)	The sash was double clicked. The default behaviour is to unsplit the window when this happens (unless the minimum pane size has been set to a value greater than zero). Processes a wxEVT_COMMAND_SPLITTER_DOUBLECLICKED event.

See also

wxSplitterEvent (p. 975)

wxSplitterWindow::wxSplitterWindow

wxSplitterWindow()

Default constructor.

wxSplitterWindow(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *point* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style=wxSP_3D*, **const wxString&** *name* = *"splitterWindow"*)

Constructor for creating the window.

Parameters

parent
    The parent of the splitter window.

id
    The window identifier.

pos
    The window position.

size
    The window size.

style
    The window style. See *wxSplitterWindow* (p. 978).

name
    The window name.

Remarks

After using this constructor, you must create either one or two subwindows with the splitter window as parent, and then call one of *wxSplitterWindow::Initialize* (p. 982), *wxSplitterWindow::SplitVertically* (p. 986) and *wxSplitterWindow::SplitHorizontally* (p. 985) in order to set the pane(s).

You can create two windows, with one hidden when not being shown; or you can create and delete the second pane on demand.

See also

wxSplitterWindow::Initialize (p. 982), *wxSplitterWindow::SplitVertically* (p. 986), *wxSplitterWindow::SplitHorizontally* (p. 985), *wxSplitterWindow::Create* (p. 980)

wxSplitterWindow::~wxSplitterWindow

 ~wxSplitterWindow()

Destroys the wxSplitterWindow and its children.

wxSplitterWindow::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **int** *x*, **const wxPoint&** *point* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style*=*wxSP_3D*, **const**

wxString& *name* = *"splitterWindow"*)

Creation function, for two-step construction. See *wxSplitterWindow::wxSplitterWindow* (p. 979) for details.

wxSplitterWindow::GetMinimumPaneSize

int **GetMinimumPaneSize**() **const**

Returns the current minimum pane size (defaults to zero).

See also

wxSplitterWindow::SetMinimumPaneSize (p. 984)

wxSplitterWindow::GetSashPosition

int **GetSashPosition**()

Returns the current sash position.

See also

wxSplitterWindow::SetSashPosition (p. 984)

wxSplitterWindow::GetSplitMode

int **GetSplitMode**() **const**

Gets the split mode.

See also

wxSplitterWindow::SetSplitMode (p. 985), *wxSplitterWindow::SplitVertically* (p. 986), *wxSplitterWindow::SplitHorizontally* (p. 985).

wxSplitterWindow::GetWindow1

wxWindow* **GetWindow1**() **const**

Returns the left/top or only pane.

wxSplitterWindow::GetWindow2

wxWindow* **GetWindow2**() **const**

Returns the right/bottom pane.

wxSplitterWindow::Initialize

void Initialize(**wxWindow*** *window*)

Initializes the splitter window to have one pane.

Parameters

window
    The pane for the unsplit window.

Remarks

This should be called if you wish to initially view only a single pane in the splitter window.

See also

wxSplitterWindow::SplitVertically (p. 986), *wxSplitterWindow::SplitHorizontally* (p. 985)

wxSplitterWindow::IsSplit

bool IsSplit() **const**

Returns TRUE if the window is split, FALSE otherwise.

wxSplitterWindow::OnDoubleClickSash

virtual void OnDoubleClickSash(**int** *x*, **int** *y*)

Application-overridable function called when the sash is double-clicked with the left mouse button.

Parameters

x
    The x position of the mouse cursor.

y
    The y position of the mouse cursor.

Remarks

The default implementation of this function calls *Unsplit* (p. 987) if the minimum pane size is zero.

See also

wxSplitterWindow::Unsplit (p. 987)

wxSplitterWindow::OnUnsplit

virtual void OnUnsplit(**wxWindow*** *removed*)

Application-overridable function called when the window is unsplit, either programmatically or using the wxSplitterWindow user interface.

Parameters

removed
    The window being removed.

Remarks

The default implementation of this function simply hides *removed.* You may wish to delete the window.

wxSplitterWindow::OnSashPositionChange

virtual bool OnSashPositionChange (**int** *newSashPosition*)

Application-overridable function called when the sash position is changed by user. It may return FALSE to prevent the change or TRUE to allow it.

Parameters

newSashPosition
    The new sash position (always positive or zero)

Remarks

The default implementation of this function verifies that the sizes of both panes of the splitter are greater than minimum pane size.

wxSplitterWindow::ReplaceWindow

bool ReplaceWindow(**wxWindow *** *winOld*, **wxWindow *** *winNew*)

This function replaces one of the windows managed by the wxSplitterWindow with another one. It is in general better to use it instead of calling Unsplit() and then resplitting the window back because it will provoke much less flicker (if any). It is valid to call this function whether the splitter has two windows or only one.

Both parameters should be non-NULL and *winOld* must specify one of the windows managed by the splitter. If the parameters are incorrect or the window couldn't be replaced, FALSE is returned. Otherwise the function will return TRUE, but please notice that it will not delete the replaced window and you may wish to do it yourself.

See also

wxSplitterWindow::GetMinimumPaneSize (p. 981)

See also

wxSplitterWindow::Unsplit (p. 987)
wxSplitterWindow::SplitVertically (p. 986)
wxSplitterWindow::SplitHorizontally (p. 985)

wxSplitterWindow::SetSashPosition

void SetSashPosition(**int** *position*, **const bool** *redraw* = *TRUE*)

Sets the sash position.

Parameters

position
     The sash position in pixels.

redraw
     If TRUE, resizes the panes and redraws the sash and border.

Remarks

Does not currently check for an out-of-range value.

See also

wxSplitterWindow::GetSashPosition (p. 981)

wxSplitterWindow::SetMinimumPaneSize

void SetMinimumPaneSize(**int** *paneSize*)

Sets the minimum pane size.

Parameters

paneSize
     Minimum pane size in pixels.

Remarks

The default minimum pane size is zero, which means that either pane can be reduced to zero by dragging the sash, thus removing one of the panes. To prevent this behaviour (and veto out-of-range sash dragging), set a minimum size, for example 20 pixels. If the wxSP_PERMIT_UNSPLIT style is used when a splitter window is created, the window may be unsplit even if minimum size is non-zero.

See also

wxSplitterWindow::GetMinimumPaneSize (p. 981)

wxSplitterWindow::SetSplitMode

void SetSplitMode(**int** *mode*)

Sets the split mode.

Parameters

mode
    Can be wxSPLIT_VERTICAL or wxSPLIT_HORIZONTAL.

Remarks

Only sets the internal variable; does not update the display.

See also

wxSplitterWindow::GetSplitMode (p. 981), *wxSplitterWindow::SplitVertically* (p. 986), *wxSplitterWindow::SplitHorizontally* (p. 985).

wxSplitterWindow::SplitHorizontally

bool SplitHorizontally(**wxWindow*** *window1*, **wxWindow*** *window2*, **int** *sashPosition = 0*)

Initializes the top and bottom panes of the splitter window.

Parameters

window1
    The top pane.

window2
    The bottom pane.

sashPosition
> The initial position of the sash. If this value is positive, it specifies the size of the upper pane. If it is negative, it is absolute value gives the size of the lower pane. Finally, specify 0 (default) to choose the default position (half of the total window height).

Return value

TRUE if successful, FALSE otherwise (the window was already split).

Remarks

This should be called if you wish to initially view two panes. It can also be called at any subsequent time, but the application should check that the window is not currently split using *IsSplit* (p. 982).

See also

wxSplitterWindow::SplitVertically (p. 986), *wxSplitterWindow::IsSplit* (p. 982), *wxSplitterWindow::Unsplit* (p. 987)

wxSplitterWindow::SplitVertically

bool SplitVertically(**wxWindow*** *window1*, **wxWindow*** *window2*, **int** *sashPosition = 0*)

Initializes the left and right panes of the splitter window.

Parameters

window1
> The left pane.

window2
> The right pane.

sashPosition
> The initial position of the sash. If this value is positive, it specifies the size of the left pane. If it is negative, it is absolute value gives the size of the right pane. Finally, specify 0 (default) to choose the default position (half of the total window width).

Return value

TRUE if successful, FALSE otherwise (the window was already split).

Remarks

This should be called if you wish to initially view two panes. It can also be called at any subsequent time, but the application should check that the window is not currently split using *IsSplit* (p. 982).

See also

wxSplitterWindow::SplitHorizontally (p. 985), *wxSplitterWindow::IsSplit* (p. 982), *wxSplitterWindow::Unsplit* (p. 987).

wxSplitterWindow::Unsplit

bool Unsplit(**wxWindow*** *toRemove = NULL*)

Unsplits the window.

Parameters

toRemove
> The pane to remove, or NULL to remove the right or bottom pane.

Return value

TRUE if successful, FALSE otherwise (the window was not split).

Remarks

This call will not actually delete the pane being removed; it calls *OnUnsplit* (p. 983) which can be overridden for the desired behaviour. By default, the pane being removed is hidden.

See also

wxSplitterWindow::SplitHorizontally (p. 985), *wxSplitterWindow::SplitVertically* (p. 986), *wxSplitterWindow::IsSplit* (p. 982), *wxSplitterWindow::OnUnsplit* (p. 983)

wxStaticBitmap

A static bitmap control displays a bitmap.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/statbmp.h>

Window styles

There are no special styles for this control.

See also *window styles overview* (p. 1379).

See also

wxStaticBitmap (p. 987), *wxStaticBox* (p. 989)

Remarks

The bitmap to be displayed should have a small number of colours, such as 16, to avoid palette problems.

wxStaticBitmap::wxStaticBitmap

wxStaticBitmap()

Default constructor.

wxStaticBitmap(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxBitmap&** *label = "",* **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "staticBitmap"*)

Constructor, creating and showing a text control.

Parameters

parent
　　Parent window. Should not be NULL.

id
　　Control identifier. A value of -1 denotes a default value.

label
　　Bitmap label.

pos
　　Window position.

size
　　Window size.

style
　　Window style. See *wxStaticBitmap* (p. 987).

name
    Window name.

See also

wxStaticBitmap::Create (p. 989)

wxStaticBitmap::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxBitmap&** *label = ""*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "staticBitmap"*)

Creation function, for two-step construction. For details see *wxStaticBitmap::wxStaticBitmap* (p. 988).

wxStaticBitmap::GetBitmap

wxBitmap& GetBitmap() **const**

Returns a reference to the label bitmap.

See also

wxStaticBitmap::SetBitmap (p. 989)

wxStaticBitmap::SetBitmap

virtual void SetBitmap(**const wxBitmap&** *label*)

Sets the bitmap label.

Parameters

label
    The new bitmap.

See also

wxStaticBitmap::GetBitmap (p. 989)

wxStaticBox

A static box is a rectangle drawn around other panel items to denote a logical grouping

of items.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/statbox.h>

Window styles

There are no special styles for this control.

See also *window styles overview* (p. 1379).

See also

wxStaticText (p. 994)

wxStaticBox::wxStaticBox

wxStaticBox()

Default constructor.

wxStaticBox(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "staticBox"*)

Constructor, creating and showing a static box.

Parameters

parent
    Parent window. Must not be NULL.

id
    Window identifier. A value of -1 indicates a default value.

label
    Text to be displayed in the static box, the empty string for no label.

pos
    Window position. If the position (-1, -1) is specified then a default position is

chosen.

size
> Checkbox size. If the size (-1, -1) is specified then a default size is chosen.

style
> Window style. See *wxStaticBox* (p. 989).

name
> Window name.

See also

wxStaticBox::Create (p. 991)

wxStaticBox::~wxStaticBox

void ~wxStaticBox()

Destructor, destroying the group box.

wxStaticBox::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *0*, **const wxString&** *name* = *"staticBox"*)

Creates the static box for two-step construction. See *wxStaticBox::wxStaticBox* (p. 990) for further details.

wxStaticBoxSizer

wxStaticBoxSizer is a sizer derived from wxBoxSizer but adds a static box around the sizer. Note that this static box has to be created separately.

See also *wxSizer* (p. 929), *wxStaticBox* (p. 989) and *wxBoxSizer* (p. 77).

Derived from

wxBoxSizer (p. 77)
wxSizer (p. 929)
wxObject (p. 750)

wxStaticBoxSizer::wxStaticBoxSizer

wxStaticBoxSizer(**wxStaticBox*** *box*, **int** *orient*)

Constructor. It takes an associated static box and the orientation *orient* as parameters - orient can be either of wxVERTICAL or wxHORIZONTAL.

wxStaticBoxSizer::GetStaticBox

wxStaticBox* GetStaticBox()

Returns the static box associated with the sizer.

wxStaticLine

A static line is just a line which may be used in a dialog to separate the groups of controls. The line may be only vertical or horizontal.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/statline.h>

Window styles

wxLI_HORIZONTAL	Creates a horizontal line.
wxLI_VERTICAL	Creates a vertical line.

See also

wxStaticBox (p. 989)

wxStaticLine::wxStaticLine

wxStaticLine()

Default constructor.

 wxStaticLine(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* =
wxDefaultPosition, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* =
wxLI_HORIZONTAL, **const wxString&** *name* = *"staticLine"*)

Constructor, creating and showing a static line.

Parameters

parent
Parent window. Must not be NULL.

id
Window identifier. A value of -1 indicates a default value.

pos
Window position. If the position (-1, -1) is specified then a default position is
chosen.

size
Size. Note that either the height or the width (depending on whether the line if
horizontal or vertical) is ignored.

style
Window style (either wxLI_HORIZONTAL or wxLI_VERTICAL).

name
Window name.

See also

wxStaticLine::Create (p. 993)

wxStaticLine::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* =
wxDefaultPosition, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *0*, **const
wxString&** *name* = *"staticLine"*)

Creates the static line for two-step construction. See *wxStaticLine::wxStaticLine* (p. 992)
for further details.

wxStaticLine::IsVertical

bool IsVertical() **const**

Returns TRUE if the line is vertical, FALSE if horizontal.

wxStaticLine::GetDefaultSize

int **GetDefaultSize**()

This static function returns the size which will be given to the smaller dimension of the static line, i.e. its height for a horizontal line or its width for a vertical one.

wxStaticText

A static text control displays one or more lines of read-only text.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/stattext.h>

Window styles

wxALIGN_LEFT	Align the text to the left
wxALIGN_RIGHT	Align the text to the right
wxALIGN_CENTRE	Center the text (horisontally)
wxST_NO_AUTORESIZE	By default, the control will adjust its size to exactly fit to the size of the text when *SetLabel* (p. 996) is called. If this style flag is given, the control will not change its size (this style is especially useful with controls which also have wxALIGN_RIGHT or CENTER style because otherwise they won't make sense any longer after a call to SetLabel)

See also *window styles overview* (p. 1379).

See also

wxStaticBitmap (p. 987), *wxStaticBox* (p. 989)

wxStaticText::wxStaticText

wxStaticText()

Default constructor.

wxStaticText(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "staticText"*)

Constructor, creating and showing a text control.

Parameters

parent
> Parent window. Should not be NULL.

id
> Control identifier. A value of -1 denotes a default value.

label
> Text label.

pos
> Window position.

size
> Window size.

style
> Window style. See *wxStaticText* (p. 994).

name
> Window name.

See also

wxStaticText::Create (p. 995)

wxStaticText::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *label*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "staticText"*)

Creation function, for two-step construction. For details see *wxStaticText::wxStaticText* (p. 995).

wxStaticText::GetLabel

wxString GetLabel() const

Returns the contents of the control.

wxStaticText::SetLabel

virtual void SetLabel(const wxString& *label*)

Sets the static text label and updates the controls size to exactly fit the label unless the control has wxST_NO_AUTORESIZE flag.

Parameters

label
　　The new label to set. It may contain newline characters.

wxStatusBar

A status bar is a narrow window that can be placed along the bottom of a frame to give small amounts of status information. It can contain one or more fields, one or more of which can be variable length according to the size of the window.

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Derived from

wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/statusbr.h>

Window styles

wxSB_SIZEGRIP	On Windows 95, displays a gripper at right-hand side of the status bar.

See also *window styles overview* (p. 1379).

Remarks

It is possible to create controls and other windows on the status bar. Position these windows from an **OnSize** event handler.

See also

wxFrame (p. 454), *Status bar sample* (p. 1334)

wxStatusBar::wxStatusBar

wxStatusBar()

Default constructor.

wxStatusBar(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *0*, **const wxString&** *name* = *"statusBar"*)

Constructor, creating the window.

Parameters

parent
 The window parent, usually a frame.

id
 The window identifier. It may take a value of -1 to indicate a default value.

pos
 The window position. A value of (-1, -1) indicates a default position, chosen by either the windowing system or wxWindows, depending on platform.

size
 The window size. A value of (-1, -1) indicates a default size, chosen by either the windowing system or wxWindows, depending on platform.

style
 The window style. See *wxStatusBar* (p. 996).

name
 The name of the window. This parameter is used to associate a name with the item, allowing the application user to set Motif resource values for individual windows.

See also

wxStatusBar::Create (p. 998)

wxStatusBar::~wxStatusBar

void ~wxStatusBar()

Destructor.

wxStatusBar::Create

bool Create (**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxString&** *name = "statusBar"*)

Creates the window, for two-step construction.

See *wxStatusBar::wxStatusBar* (p. 997) for details.

wxStatusBar::GetFieldRect

virtual bool GetFieldRect(**int** *i*, **wxRect&** *rect*) **const**

Returns the size and position of a fields internal bounding rectangle.

Parameters

i
    The field in question.

rect
    The rectangle values are placed in this variable.

Return value

TRUE if the field index is valid, FALSE otherwise.

See also

wxRect (p. 873)

wxStatusBar::GetFieldsCount

int GetFieldsCount() **const**

Returns the number of fields in the status bar.

wxStatusBar::GetStatusText

virtual wxString GetStatusText(**int** *ir = 0*) **const**

Returns the string associated with a status bar field.

Parameters

i

The number of the status field to retrieve, starting from zero.

Return value

The status field string if the field is valid, otherwise the empty string.

See also

wxStatusBar::SetStatusText (p. 1001)

wxStatusBar::DrawField

virtual void DrawField(**wxDC&** *dc*, **int** *i*)

Draws a field, including shaded borders and text.

Parameters

dc

The device context to draw onto.

i

The field to be drawn.

See also

wxStatusBar::DrawFieldText (p. 999)

wxStatusBar::DrawFieldText

virtual void DrawFieldText(**wxDC&** *dc*, **int** *i*)

Draws a field's text.

Parameters

dc

The device context to draw onto.

i
    The field whose text is to be drawn.

See also

wxStatusBar::DrawField (p. 999)

wxStatusBar::InitColours

virtual void InitColours()

Sets up the background colour and shading pens using suitable system colours (Windows) or tasteful shades of grey (other platforms).

Remarks

This function is called when the window is created, and also from *wxStatusBar::OnSysColourChanged* (p. 1000) on Windows.

See also

wxStatusBar::OnSysColourChanged (p. 1000)

wxStatusBar::OnSysColourChanged

void OnSysColourChanged(**wxSysColourChangedEvent&** *event*)

Handles a system colour change by calling *wxStatusBar::InitColours* (p. 1000), and refreshes the window.

Parameters

event
    The colour change event.

See also

wxStatusBar::InitColours (p. 1000)

wxStatusBar::SetFieldsCount

virtual void SetFieldsCount(**int** *number = 1*, **int*** *widths = NULL*)

Sets the number of fields, and optionally the field widths.

wxPython note: Only the first parameter is accepted. Use SetStatusWidths to set the widths of the fields.

Parameters

number
> The number of fields.

widths
> An array of *n* integers, each of which is a status field width in pixels. A value of -1 indicates that the field is variable width; at least one field must be -1.

wxStatusBar::SetMinHeight

void SetMinHeight(**int** *height*)

Sets the minimal possible hight for the status bar. The real height may be bigger than the height specified here depending on the size of the font used by the status bar.

wxStatusBar::SetStatusText

virtual void SetStatusText(**const wxString&** *text*, **int** *i = 0*)

Sets the text for one field.

Parameters

text
> The text to be set. Use an empty string ("") to clear the field.

i
> The field to set, starting from zero.

See also

wxStatusBar::GetStatusText (p. 999), *wxFrame::SetStatusText* (p. 465)

wxStatusBar::SetStatusWidths

virtual void SetStatusWidths(**int** *n*, **int** *widths)

Sets the widths of the fields in the status line.

Parameters

n
> The number of fields in the status bar.

widths

Must contain an array of *n* integers, each of which is a status field width in pixels. A value of -1 indicates that the field is variable width; at least one field must be -1. You should delete this array after calling **SetStatusWidths**.

Remarks

The widths of the variable fields are calculated from the total width of all fields, minus the sum of widths of the non-variable fields, divided by the number of variable fields.

See also

wxStatusBar::SetFieldsCount (p. 1000), *wxFrame::SetStatusWidths* (p. 465)

wxPython note: Only a single parameter is required, a Python list of integers.

wxStopWatch

The wxStopWatch class allow you to measure time intervals.

Include files

<wx/timer.h>

See also

::wxStartTimer (p. 1308), *::wxGetElapsedTime* (p. 1307), *wxTimer* (p. 1118)

wxStopWatch::wxStopWatch

wxStopWatch()

Constructor. This starts the stop watch.

wxStopWatch::Pause

void Pause()

Pauses the stop watch. Call *wxStopWatch::Resume* (p. 1003) to resume time measuring again.

wxStopWatch::Start

void Start(**long** *milliseconds = 0*)

(Re)starts the stop watch with a given initial value.

wxStopWatch::Resume

void Resume()

Resumes the stop watch after having been paused with *wxStopWatch::Pause* (p. 1002).

wxStopWatch::Time

long Time()

Returns the time in milliseconds since the start (or restart) or the last call of
wxStopWatch::Pause (p. 1002).

wxStreamBase

This class is the base class of most stream related classes in wxWindows. It must not be
used directly.

Derived from

None

Include files

<wx/stream.h>

See also

wxStreamBuffer (p. 1005)

wxStreamBase::wxStreamBase

wxStreamBase()

Creates a dummy stream object. It doesn't do anything.

wxStreamBase::~wxStreamBase

~wxStreamBase()

Destructor.

wxStreamBase::IsOk

wxStreamError IsOk() **const**

Returns TRUE if no error occurred on the stream.

See also

LastError (p. 1004)

wxStreamBase::LastError

wxStreamError LastError() **const**

This function returns the last error.

wxSTREAM_NO_ERROR   No error occurred.
wxSTREAM_EOF   An End-Of-File occurred.
wxSTREAM_WRITE_ERROR   A generic error occurred on the last write call.
wxSTREAM_READ_ERROR   A generic error occurred on the last read call.

wxStreamBase::OnSysRead

size_t OnSysRead(**void*** *buffer*, **size_t** *bufsize*)

Internal function. It is called when the stream wants to read data of the specified size. It should return the size that was actually read.

wxStreamBase::OnSysSeek

off_t OnSysSeek(**off_t** *pos*, **wxSeekMode** *mode*)

Internal function. It is called when the stream needs to change the current position.

wxStreamBase::OnSysTell

off_t OnSysTell() **const**

Internal function. Is is called when the stream needs to know the real position.

wxStreamBase::OnSysWrite

size_t OnSysWrite(**void ***_buffer_, **size_t** _bufsize_)

See *OnSysRead* (p. 1004).

wxStreamBase::GetSize

size_t GetSize() **const**

This function returns the size of the stream. For example, for a file it is the size of the file.

Warning

There are streams which do not have size by definition, such as socket streams. In that cases, GetSize returns an invalid size represented by

```
~(size_t)0
```

wxStreamBuffer

Derived from

None

Include files

<wx/stream.h>

See also

wxStreamBase (p. 1003)

wxStreamBuffer::wxStreamBuffer

wxStreamBuffer(**wxStreamBase&** _stream_, **BufMode** _mode_)

Constructor, creates a new stream buffer using *stream* as a parent stream and *mode* as the IO mode. *mode* can be: wxStreamBuffer::read, wxStreamBuffer::write, wxStreamBuffer::read_write.

One stream can have many stream buffers but only one is used internally to pass IO call (e.g. wxInputStream::Read() -> wxStreamBuffer::Read()), but you can call directly wxStreamBuffer::Read without any problems. Note that all errors and messages linked to the stream are stored in the stream, not the stream buffers:

```
streambuffer.Read(...);
streambuffer2.Read(...); /* This call erases previous error messages
set by
                         ``streambuffer'' */
```

wxStreamBuffer(**BufMode** *mode*)

Constructor, creates a new empty stream buffer which won't flush any data to a stream. *mode* specifies the type of the buffer (read, write, read_write). This stream buffer has the advantage to be stream independent and to work only on memory buffers but it is still compatible with the rest of the wxStream classes. You can write, read to this special stream and it will grow (if it is allowed by the user) its internal buffer. Briefly, it has all functionality of a "normal'' stream.

Warning

The "read_write" mode may not work: it isn't completely finished.

wxStreamBuffer(**const wxStreamBuffer&***buffer*)

Constructor. It initializes the stream buffer with the data of the specified stream buffer. The new stream buffer has the same attributes, size, position and they share the same buffer. This will cause problems if the stream to which the stream buffer belong is destroyed and the newly cloned stream buffer continues to be used, trying to call functions in the (destroyed) stream. It is advised to use this feature only in very local area of the program.

See also

wxStreamBuffer:SetBufferIO (p. 1008)

wxStreamBuffer::~wxStreamBuffer

wxStreamBuffer(~wxStreamBuffer)

Destructor. It finalizes all IO calls and frees all internal buffers if necessary.

wxStreamBuffer::Read

size_t Read(**void** **buffer*, **size_t** *size*)

Reads a block of the specified *size* and stores the data in *buffer*. This function tries to read from the buffer first and if more data has been requested, reads more data from the associated stream and updates the buffer accordingly until all requested data is read.

Return value

It returns the size of the data read. If the returned size is different of the specified *size*, an error has occurred and should be tested using *LastError* (p. 1004).

size_t Read(**wxStreamBuffer ****buffer*)

Reads a *buffer*. The function returns when *buffer* is full or when there isn't data anymore in the current buffer.

See also

wxStreamBuffer::Write (p. 1007)

wxStreamBuffer::Write

size_t Write(**const void ****buffer*, **size_t** *size*)

Writes a block of the specified *size* using datas of *buffer*. The datas are cached in a buffer before being sent in one block to the stream.

size_t Write(**wxStreamBuffer ****buffer*)

See *Read* (p. 1006).

wxStreamBuffer::GetChar

char GetChar()

Gets a single char from the stream buffer. It acts like the Read call.

Problem

You aren't directly notified if an error occurred during the IO call.

See also

wxStreamBuffer::Read (p. 1006)

wxStreamBuffer::PutChar

void PutChar(**char** *c*)

Puts a single char to the stream buffer.

Problem

You aren't directly notified if an error occurred during the IO call.

See also

wxStreamBuffer::Read (p. 1007)

wxStreamBuffer::Tell

off_t Tell() **const**

Gets the current position in the stream. This position is calculated from the *real* position in the stream and from the internal buffer position: so it gives you the position in the *real* stream counted from the start of the stream.

Return value

Returns the current position in the stream if possible, wxInvalidOffset in the other case.

wxStreamBuffer::Seek

off_t Seek(**off_t** *pos*, **wxSeekMode** *mode*)

Changes the current position.

mode may be one of the following:

wxFromStart	The position is counted from the start of the stream.
wxFromCurrent	The position is counted from the current position of the stream.
wxFromEnd	The position is counted from the end of the stream.

Return value

Upon successful completion, it returns the new offset as measured in bytes from the beginning of the stream. Otherwise, it returns wxInvalidOffset.

wxStreamBuffer::ResetBuffer

void ResetBuffer()

Resets to the initial state variables concerning the buffer.

wxStreamBuffer::SetBufferIO

void SetBufferIO(**char*** *buffer_start*, **char*** *buffer_end*)

Specifies which pointers to use for stream buffering. You need to pass a pointer on the start of the buffer end and another on the end. The object will use this buffer to cache stream data. It may be used also as a source/destination buffer when you create an empty stream buffer (See *wxStreamBuffer::wxStreamBuffer* (p. 1005)).

Remarks

When you use this function, you will have to destroy the IO buffers yourself after the stream buffer is destroyed or don't use it anymore. In the case you use it with an empty buffer, the stream buffer will not resize it when it is full.

See also

wxStreamBuffer constructor (p. 1005)
wxStreamBuffer::Fixed (p. 1010)
wxStreamBuffer::Flushable (p. 1010)

void SetBufferIO(**size_t** *bufsize*)

Destroys or invalidates the previous IO buffer and allocates a new one of the specified size.

Warning

All previous pointers aren't valid anymore.

Remark

The created IO buffer is growable by the object.

See also

wxStreamBuffer::Fixed (p. 1010)
wxStreamBuffer::Flushable (p. 1010)

wxStreamBuffer::GetBufferStart

char * GetBufferStart() **const**

Returns a pointer on the start of the stream buffer.

wxStreamBuffer::GetBufferEnd

char * GetBufferEnd() **const**

Returns a pointer on the end of the stream buffer.

wxStreamBuffer::GetBufferPos

char * GetBufferPos() **const**

Returns a pointer on the current position of the stream buffer.

wxStreamBuffer::GetIntPosition

off_t GetIntPosition() **const**

Returns the current position (counted in bytes) in the stream buffer.

wxStreamBuffer::SetIntPosition

void SetIntPosition()

Sets the current position (in bytes) in the stream buffer.

Warning

Since it is a very low-level function, there is no check on the position: specify an invalid position can induce unexpected results.

wxStreamBuffer::GetLastAccess

size_t GetLastAccess() **const**

Returns the amount of bytes read during the last IO call to the parent stream.

wxStreamBuffer::Fixed

void Fixed(**bool** *fixed*)

Toggles the fixed flag. Usually this flag is toggled at the same time as *flushable*. This flag allows (when it has the FALSE value) or forbids (when it has the TRUE value) the stream buffer to resize dynamically the IO buffer.

See also

wxStreamBuffer::SetBufferIO (p. 1008)

wxStreamBuffer::Flushable

void Flushable(**bool** *flushable*)

Toggles the flushable flag. If *flushable* is disabled, no datas are sent to the parent stream.

wxStreamBuffer::FlushBuffer

bool FlushBuffer()

Flushes the IO buffer.

wxStreamBuffer::FillBuffer

bool FillBuffer()

Fill the IO buffer.

wxStreamBuffer::GetDataLeft

size_t GetDataLeft()

Returns the amount of available datas in the buffer.

wxStreamBuffer::Stream

wxStreamBase* Stream()

Returns the parent stream of the stream buffer.

wxString

wxString is a class representing a character string. Please see the *wxString overview* (p. 1339) for more information about it. As explained there, wxString implements about 90% of methods of the std::string class (iterators are not supported, nor all methods which use them). These standard functions are not documented in this manual so please see the STL documentation. The behaviour of all these functions is identical to the behaviour described there.

Derived from

None

Include files

<wx/string.h>

Predefined objects

Objects:

wxEmptyString

See also

Overview (p. 1339)

Constructors and assignment operators

A strign may be constructed either from a C string, (some number of copies of) a single character or a wide (UNICODE) string. For all constructors (except the default which creates an empty string) there is also a corresponding assignment operator.

wxString (p. 1019)
operator = (p. 1032)
~wxString (p. 1019)

String length

These functions return the string length and check whether the string is empty or empty it.

Len (p. 1026)
IsEmpty (p. 1025)
operator! (p. 1031)
Empty (p. 1022)
Clear (p. 1021)

Character access

Many functions in this section take a character index in the string. As with C strings and/or arrays, the indices start from 0, so the first character of a string is string[0]. Attempt to access a character beyond the end of the string (which may be even 0 if the string is empty) will provocate an assert failure in *debug build* (p. 1363), but no checks are done in release builds.

This section also contains both implicit and explicit conversions to C style strings.

Although implicit conversion is quite convenient, it is advised to use explicit *c_str()* (p. 1021) method for the sake of clarity. Also see *overview* (p. 1340) for the cases where it is necessary to use it.

GetChar (p. 1023)
GetWritableChar (p. 1024)
SetChar (p. 1029)
Last (p. 1026)
operator [] (p. 1032)
c_str (p. 1021)
operator const char* (p. 1033)

Concatenation

Anything may be concatenated (appended to) with a string. However, you can't append something to a C string (including literal constants), so to do this it should be converted to a wxString first.

operator << (p. 1033)
operator += (p. 1032)
operator + (p. 1032)
Append (p. 1020)
Prepend (p. 1028)

Comparison

The default comparison function *Cmp* (p. 1021) is case-sensitive and so is the default version of *IsSameAs* (p. 1025). For case insensitive comparisons you should use *CmpNoCase* (p. 1022) or give a second parameter to IsSameAs. This last function is may be more convenient if only equality of the strings matters because it returns a boolean true value if the strings are the same and not 0 (which is usually FALSE in C) as Cmp() does.

Matches (p. 1027) is a poor man's regular expression matcher: it only understands '*' and '?' metacharacters in the sense of DOS command line interpreter.

StartsWith (p. 1029) is helpful when parsing a line of text which should start with some predefined prefix and is more efficient than doing direct string comparaison as you would also have to precalculate the length of the prefix then.

Cmp (p. 1021)
CmpNoCase (p. 1022)
IsSameAs (p. 1025)
Matches (p. 1027)
StartsWith (p. 1029)

Substring extraction

These functions allow to extract substring from this string. All of them don't modify the original string and return a new string containing the extracted substring.

Mid (p. 1027)
operator() (p. 1033)
Left (p. 1026)
Right (p. 1029)
BeforeFirst (p. 1021)
BeforeLast (p. 1021)
AfterFirst (p. 1020)
AfterLast (p. 1020)
StartsWith (p. 1029)

Case conversion

The MakeXXX() variants modify the string in place, while the other functions return a new string which containts the original text converted to the upper or lower case and leave the original string unchanged.

MakeUpper (p. 1027)
Upper (p. 1031)
MakeLower (p. 1027)
Lower (p. 1026)

Searching and replacing

These functions replace the standard *strchr()* and *strstr()* functions.

Find (p. 1022)
Replace (p. 1028)

Conversion to numbers

The string provides functions for conversion to signed and unsigned integer and floating point numbers. All three functions take a pointer to the variable to put the numeric value in and return TRUE if the **entire** string could be converted to a number.

ToLong (p. 1030)
ToULong (p. 1030)
ToDouble (p. 1030)

Writing values into the string

Both formatted versions (*Printf* (p. 1028)) and stream-like insertion operators exist (for basic types only). Additionally, the *Format* (p. 1023) function allows to use simply

append formatted value to a string:

```
// the following 2 snippets are equivalent

wxString s = "...";
s += wxString::Format("%d", n);

wxString s;
s.Printf("...%d", n);
```

Format (p. 1023)
FormatV (p. 1023)
Printf (p. 1028)
PrintfV (p. 1028)
operator << (p. 1033)

Memory management

These are "advanced" functions and they will be needed quite rarily. *Alloc* (p. 1019) and *Shrink* (p. 1029) are only interesting for optimization purposes. *GetWriteBuf* (p. 1024) may be very useful when working with some external API which requires the caller to provide a writable buffer, but extreme care should be taken when using it: before performing any other operation on the string *UngetWriteBuf* (p. 1031) **must** be called!

Alloc (p. 1019)
Shrink (p. 1029)
GetWriteBuf (p. 1024)
UngetWriteBuf (p. 1031)

Miscellaneous

Other string functions.

Trim (p. 1031)
Pad (p. 1027)
Truncate (p. 1031)

wxWindows 1.xx compatibility functions

These functions are deprecated, please consider using new wxWindows 2.0 functions instead of them (or, even better, std::string compatible variants).

SubString (p. 1030)
sprintf (p. 1029)
CompareTo (p. 1022)
Length (p. 1026)
Freq (p. 1023)
LowerCase (p. 1027)

UpperCase (p. 1031)
Strip (p. 1029)
Index (p. 1024)
Remove (p. 1028)
First (p. 1023)
Last (p. 1026)
Contains (p. 1022)
IsNull (p. 1025)
IsAscii (p. 1024)
IsNumber (p. 1025)
IsWord (p. 1026)

std::string compatibility functions

The supported functions are only listed here, please see any STL reference for their documentation.

```
  // take nLen chars starting at nPos
wxString(const wxString& str, size_t nPos, size_t nLen);
  // take all characters from pStart to pEnd (poor man's iterators)
wxString(const void *pStart, const void *pEnd);

// lib.string.capacity
  // return the length of the string
size_t size() const;
  // return the length of the string
size_t length() const;
  // return the maximum size of the string
size_t max_size() const;
  // resize the string, filling the space with c if c != 0
void resize(size_t nSize, char ch = '\0');
  // delete the contents of the string
void clear();
  // returns true if the string is empty
bool empty() const;

// lib.string.access
  // return the character at position n
char at(size_t n) const;
  // returns the writable character at position n
char& at(size_t n);

// lib.string.modifiers
  // append a string
wxString& append(const wxString& str);
  // append elements str[pos], ..., str[pos+n]
wxString& append(const wxString& str, size_t pos, size_t n);
  // append first n (or all if n == npos) characters of sz
wxString& append(const char *sz, size_t n = npos);

  // append n copies of ch
wxString& append(size_t n, char ch);
```

```
    // same as `this_string = str'
  wxString& assign(const wxString& str);
    // same as ` = str[pos..pos + n]
  wxString& assign(const wxString& str, size_t pos, size_t n);
    // same as `= first n (or all if n == npos) characters of sz'
  wxString& assign(const char *sz, size_t n = npos);
    // same as `= n copies of ch'
  wxString& assign(size_t n, char ch);

    // insert another string
  wxString& insert(size_t nPos, const wxString& str);
    // insert n chars of str starting at nStart (in str)
  wxString& insert(size_t nPos, const wxString& str, size_t nStart,
size_t n);

    // insert first n (or all if n == npos) characters of sz
  wxString& insert(size_t nPos, const char *sz, size_t n = npos);
    // insert n copies of ch
  wxString& insert(size_t nPos, size_t n, char ch);

    // delete characters from nStart to nStart + nLen
  wxString& erase(size_t nStart = 0, size_t nLen = npos);

    // replaces the substring of length nLen starting at nStart
  wxString& replace(size_t nStart, size_t nLen, const char* sz);
    // replaces the substring with nCount copies of ch
  wxString& replace(size_t nStart, size_t nLen, size_t nCount, char
ch);
    // replaces a substring with another substring
  wxString& replace(size_t nStart, size_t nLen,
                    const wxString& str, size_t nStart2, size_t nLen2);
    // replaces the substring with first nCount chars of sz
    wxString& replace(size_t nStart, size_t nLen,
                      const char* sz, size_t nCount);

    // swap two strings
  void swap(wxString& str);

    // All find() functions take the nStart argument which specifies
the
    // position to start the search on, the default value is 0. All
functions
    // return npos if there were no match.

    // find a substring
  size_t find(const wxString& str, size_t nStart = 0) const;

    // find first n characters of sz
  size_t find(const char* sz, size_t nStart = 0, size_t n = npos)
const;

    // find the first occurence of character ch after nStart
  size_t find(char ch, size_t nStart = 0) const;

    // rfind() family is exactly like find() but works right to left

    // as find, but from the end
```

```
  size_t rfind(const wxString& str, size_t nStart = npos) const;

    // as find, but from the end
  size_t rfind(const char* sz, size_t nStart = npos,
          size_t n = npos) const;
    // as find, but from the end
  size_t rfind(char ch, size_t nStart = npos) const;

    // find first/last occurence of any character in the set

    //
  size_t find_first_of(const wxString& str, size_t nStart = 0) const;
    //
  size_t find_first_of(const char* sz, size_t nStart = 0) const;
    // same as find(char, size_t)
  size_t find_first_of(char c, size_t nStart = 0) const;
    //
  size_t find_last_of (const wxString& str, size_t nStart = npos)
const;
    //
  size_t find_last_of (const char* s, size_t nStart = npos) const;
    // same as rfind(char, size_t)
  size_t find_last_of (char c, size_t nStart = npos) const;

    // find first/last occurence of any character not in the set

    //
  size_t find_first_not_of(const wxString& str, size_t nStart = 0)
const;
    //
  size_t find_first_not_of(const char* s, size_t nStart = 0) const;
    //
  size_t find_first_not_of(char ch, size_t nStart = 0) const;
    //
  size_t find_last_not_of(const wxString& str, size_t nStart=npos)
const;
    //
  size_t find_last_not_of(const char* s, size_t nStart = npos) const;
    //
  size_t find_last_not_of(char ch, size_t nStart = npos) const;

    // All compare functions return a negative, zero or positive value
    // if the [sub]string is less, equal or greater than the compare()
argument.

    // just like strcmp()
  int compare(const wxString& str) const;
    // comparison with a substring
  int compare(size_t nStart, size_t nLen, const wxString& str) const;
    // comparison of 2 substrings
  int compare(size_t nStart, size_t nLen,
              const wxString& str, size_t nStart2, size_t nLen2) const;
    // just like strcmp()
  int compare(const char* sz) const;
    // substring comparison with first nCount characters of sz
  int compare(size_t nStart, size_t nLen,
              const char* sz, size_t nCount = npos) const;
```

```
// substring extraction
wxString substr(size_t nStart = 0, size_t nLen = npos) const;
```

wxString::wxString

wxString()

Default constructor.

wxString(**const wxString&** *x*)

Copy constructor.

wxString(**char** *ch*, **size_t** *n = 1*)

Constructs a string of *n* copies of character *ch*.

wxString(**const char*** *psz*, **size_t** *nLength = wxSTRING_MAXLEN*)

Takes first *nLength* characters from the C string *psz*. The default value of wxSTRING_MAXLEN means to take all the string.

Note that this constructor may be used even if *psz* points to a buffer with binary data (i.e. containing NUL characters) as long as you provide the correct value for *nLength*. However, the default form of it works only with strings without intermediate NULs because it uses strlen() to calculate the effective length and it would not give correct results otherwise.

wxString(**const unsigned char*** *psz*, **size_t** *nLength = wxSTRING_MAXLEN*)

For compilers using unsigned char: takes first *nLength* characters from the C string *psz*. The default value of wxSTRING_MAXLEN means take all the string.

wxString(**const wchar_t*** *psz*)

Constructs a string from the wide (UNICODE) string.

wxString::~wxString

~wxString()

String destructor. Note that this is not virtual, so wxString must not be inherited from.

wxString::Alloc

void Alloc(**size_t** *nLen*)

Preallocate enough space for wxString to store *nLen* characters. This function may be
used to increase speed when the string is constructed by repeated concatenation as in

```
// delete all vowels from the string
wxString DeleteAllVowels(const wxString& original)
{
    wxString result;

    size_t len = original.length();

    result.Alloc(len);

    for ( size_t n = 0; n < len; n++ )
    {
        if ( strchr("aeuio", tolower(original[n])) == NULL )
            result += original[n];
    }

    return result;
}
```

because it will avoid the need of reallocating string memory many times (in case of long
strings). Note that it does not set the maximal length of a string - it will still expand if
more than *nLen* characters are stored in it. Also, it does not truncate the existing string
(use *Truncate()* (p. 1031) for this) even if its current length is greater than *nLen*

wxString::Append

wxString& Append(**const char*** *psz*)

Concatenates *psz* to this string, returning a reference to it.

wxString& Append(**char** *ch*, **int** *count = 1*)

Concatenates character *ch* to this string, *count* times, returning a reference to it.

wxString::AfterFirst

wxString AfterFirst(**char** *ch*) **const**

Gets all the characters after the first occurence of *ch*. Returns the empty string if *ch* is
not found.

wxString::AfterLast

wxString AfterLast(**char** *ch*) **const**

Gets all the characters after the last occurence of *ch*. Returns the whole string if *ch* is not found.

wxString::BeforeFirst

wxString BeforeFirst(**char** *ch*) **const**

Gets all characters before the first occurence of *ch*. Returns the whole string if *ch* is not found.

wxString::BeforeLast

wxString BeforeLast(**char** *ch*) **const**

Gets all characters before the last occurence of *ch*. Returns the empty string if *ch* is not found.

wxString::c_str

const char * c_str() **const**

Returns a pointer to the string data.

wxString::Clear

void Clear()

Empties the string and frees memory occupied by it.

See also: *Empty* (p. 1022)

wxString::Cmp

int Cmp(**const char*** *psz*) **const**

Case-sensitive comparison.

Returns a positive value if the string is greater than the argument, zero if it is equal to it or a negative value if it is less than the argument (same semantics as the standard *strcmp()* function).

See also *CmpNoCase* (p. 1022), *IsSameAs* (p. 1025).

wxString::CmpNoCase

int CmpNoCase(**const char*** *psz*) **const**

Case-insensitive comparison.

Returns a positive value if the string is greater than the argument, zero if it is equal to it or a negative value if it is less than the argument (same semantics as the standard *strcmp()* function).

See also *Cmp* (p. 1021), *IsSameAs* (p. 1025).

wxString::CompareTo

```
#define NO_POS ((int)(-1)) // undefined position
enum caseCompare {exact, ignoreCase};
```

int CompareTo(**const char*** *psz*, **caseCompare** *cmp* = *exact*) **const**

Case-sensitive comparison. Returns 0 if equal, 1 if greater or -1 if less.

wxString::Contains

bool Contains(**const wxString&** *str*) **const**

Returns 1 if target appears anyhere in wxString; else 0.

wxString::Empty

void Empty()

Makes the string empty, but doesn't free memory occupied by the string.

See also: *Clear()* (p. 1021).

wxString::Find

int Find(**char** *ch*, **bool** *fromEnd* = *FALSE*) **const**

Searches for the given character. Returns the starting index, or -1 if not found.

int Find(**const char*** *sz*) **const**

Searches for the given string. Returns the starting index, or -1 if not found.

wxString::First

size_t First(**char** *c*)

size_t First(**const char*** *psz*) **const**

size_t First(**const wxString&** *str*) **const**

size_t First(**const char** *ch*) **const**

Returns the first occurrence of the item.

wxString::Format

static wxString Format(**const wxChar** **format*, ...)

This static function returns the string containing the result of calling *Printf* (p. 1028) with the passed parameters on it.

See also

FormatV (p. 1023), *Printf* (p. 1028)

wxString::FormatV

static wxString Format(**const wxChar** **format*, **va_list** *argptr*)

This static function returns the string containing the result of calling *PrintfV* (p. 1028) with the passed parameters on it.

See also

Format (p. 1023), *PrintfV* (p. 1028)

wxString::Freq

int Freq(**char** *ch*) **const**

Returns the number of occurrences of *ch* in the string.

wxString::GetChar

char GetChar(**size_t** *n*) **const**

Returns the character at position *n* (read-only).

wxString::GetData

const char* GetData() **const**

wxWindows compatibility conversion. Returns a constant pointer to the data in the string.

wxString::GetWritableChar

char& GetWritableChar (**size_t** *n*)

Returns a reference to the character at position *n*.

wxString::GetWriteBuf

char* GetWriteBuf(**size_t** *len*)

Returns a writable buffer of at least *len* bytes.

Call *wxString::UngetWriteBuf* (p. 1031) as soon as possible to put the string back into a reasonable state.

wxString::Index

size_t Index(**char** *ch*, **int** *startpos = 0*) **const**

Same as *wxString::Find* (p. 1022).

size_t Index(**const char*** *sz*) **const**

Same as *wxString::Find* (p. 1022).

size_t Index(**const char*** *sz*, **bool** *caseSensitive = TRUE*, **bool** *fromEnd = FALSE*) **const**

Search the element in the array, starting from either side.

If *fromEnd* is TRUE, reverse search direction.

If **caseSensitive**, comparison is case sensitive (the default).

Returns the index of the first item matched, or NOT_FOUND.

wxString::IsAscii

bool IsAscii() **const**

Returns TRUE if the string is ASCII.

wxString::IsEmpty

bool IsEmpty() **const**

Returns TRUE if the string is NULL.

wxString::IsNull

bool IsNull() **const**

Returns TRUE if the string is NULL (same as IsEmpty).

wxString::IsNumber

bool IsNumber() **const**

Returns TRUE if the string is a positive or negative integer. Will return FALSE for decimals.

wxString::IsSameAs

bool IsSameAs(**const char*** *psz*, **bool** *caseSensitive = TRUE*) **const**

Test for string equality, case-sensitive (default) or not.

caseSensitive is TRUE by default (case matters).

Returns TRUE if strings are equal, FALSE otherwise.

See also *Cmp* (p. 1021), *CmpNoCase* (p. 1022), *IsSameAs* (p. 1025)

wxString::IsSameAs

bool IsSameAs(**char** *c*, **bool** *caseSensitive = TRUE*) **const**

Test whether the string is equal to the single character *c*. The test is case-sensitive if *caseSensitive* is TRUE (default) or not if it is FALSE.

Returns TRUE if the string is equal to the character, FALSE otherwise.

See also *Cmp* (p. 1021), *CmpNoCase* (p. 1022), *IsSameAs* (p. 1025)

wxString::IsWord

bool IsWord() **const**

Returns TRUE if the string is a word. TODO: what's the definition of a word?

wxString::Last

char Last() **const**

Returns the last character.

char& Last()

Returns a reference to the last character (writable).

wxString::Left

wxString Left(**size_t** *count*) **const**

Returns the first *count* characters.

wxString Left(**char** *ch*) **const**

Returns all characters before the first occurence of *ch*. Returns the whole string if *ch* is not found.

wxString::Len

size_t Len() **const**

Returns the length of the string.

wxString::Length

size_t Length() **const**

Returns the length of the string (same as Len).

wxString::Lower

wxString Lower() **const**

Returns this string converted to the lower case.

wxString::LowerCase

void LowerCase()

Same as MakeLower.

wxString::MakeLower

void MakeLower()

Converts all characters to lower case.

wxString::MakeUpper

void MakeUpper()

Converts all characters to upper case.

wxString::Matches

bool Matches(**const char*** *szMask*) **const**

Returns TRUE if the string contents matches a mask containing '*' and '?'.

wxString::Mid

wxString Mid(**size_t** *first*, **size_t** *count = wxSTRING_MAXLEN*) **const**

Returns a substring starting at *first*, with length *count*, or the rest of the string if *count* is the default value.

wxString::Pad

wxString& Pad(**size_t** *count*, **char** *pad = ' '*, **bool** *fromRight = TRUE*)

Adds *count* copies of *pad* to the beginning, or to the end of the string (the default).

Removes spaces from the left or from the right (default).

wxString::Prepend

wxString& Prepend(**const wxString&** *str*)

Prepends *str* to this string, returning a reference to this string.

wxString::Printf

int Printf(**const char*** *pszFormat*, ...)

Similar to the standard function *sprintf()*. Returns the number of characters written, or an integer less than zero on error.

NB: This function will use a safe version of *vsprintf()* (usually called *vsnprintf()*) whenever available to always allocate the buffer of correct size. Unfortunately, this function is not available on all platforms and the dangerous *vsprintf()* will be used then which may lead to buffer overflows.

wxString::PrintfV

int PrintfV(**const char*** *pszFormat*, **va_list** *argPtr*)

Similar to vprintf. Returns the number of characters written, or an integer less than zero on error.

wxString::Remove

wxString& Remove(**size_t** *pos*)

Same as Truncate. Removes the portion from *pos* to the end of the string.

wxString& Remove(**size_t** *pos*, **size_t** *len*)

Removes the *len* characters from the string, starting at *pos*.

wxString::RemoveLast

wxString& RemoveLast()

Removes the last character.

wxString::Replace

size_t Replace(**const char*** *szOld*, **const char*** *szNew*, **bool** *replaceAll = TRUE*)

Replace first (or all) occurences of substring with another one.

replaceAll: global replace (default), or only the first occurence.

Returns the number of replacements made.

wxString::Right

wxString Right(**size_t** *count*) **const**

Returns the last *count* characters.

wxString::SetChar

void SetChar(**size_t** *n*, **char** *ch*)

Sets the character at position *n*.

wxString::Shrink

void Shrink()

Minimizes the string's memory. This can be useful after a call to *Alloc()* (p. 1019) if too much memory were preallocated.

wxString::sprintf

void sprintf(**const char*** *fmt*)

The same as Printf.

wxString::StartsWith

bool StartsWith(**const wxChar** **prefix*, **wxString** **rest = NULL*) **const**

This function can be used to test if the string starts with the specified *prefix*. If it does, the function will return TRUE and put the rest of the string (i.e. after the prefix) into *rest* string if it is not NULL. Otherwise, the function returns FALSE and doesn't modify the *rest*.

wxString::Strip

```
enum stripType {leading = 0x1, trailing = 0x2, both = 0x3};
```

wxString Strip(**stripType** *s = trailing*) **const**

Strip characters at the front and/or end. The same as Trim except that it doesn't change this string.

wxString::SubString

wxString SubString(**size_t** *from*, **size_t** *to*) **const**

Deprecated, use *Mid* (p. 1027) instead (but note that parameters have different meaning).

Returns the part of the string between the indices *from* and *to*inclusive.

wxString::ToDouble

bool ToDouble(**double** **val*) **const**

Attempts to convert the string to a floating point number. Returns TRUE on success (the number is stored in the location pointed to by *val*) or FALSE if the string does not represent such number.

See also

wxString::ToLong (p. 1030),
wxString::ToULong (p. 1030)

wxString::ToLong

bool ToLong(**long** **val*) **const**

Attempts to convert the string to a signed integer. Returns TRUE on success (the number is stored in the location pointed to by *val*) or FALSE if the string does not represent such number.

See also

wxString::ToDouble (p. 1030),
wxString::ToULong (p. 1030)

wxString::ToULong

bool ToULong(**unsigned long** **val*) **const**

Attempts to convert the string to an unsigned integer. Returns TRUE on success (the

number is stored in the location pointed to by *val*) or FALSE if the string does not represent such number.

See also

wxString::ToDouble (p. 1030),
wxString::ToLong (p. 1030)

wxString::Trim

wxString& Trim(**bool** *fromRight = TRUE*)

Removes spaces from the left or from the right (default).

wxString::Truncate

wxString& Truncate(**size_t** *len*)

Truncate the string to the given length.

wxString::UngetWriteBuf

void UngetWriteBuf()

Puts the string back into a reasonable state, after *wxString::GetWriteBuf* (p. 1024) was called.

wxString::Upper

wxString Upper() **const**

Returns this string converted to upper case.

wxString::UpperCase

void UpperCase()

The same as MakeUpper.

wxString::operator!

bool operator!() **const**

Empty string is FALSE, so !string will only return TRUE if the string is empty. This allows the tests for NULLness of a *const char ** pointer and emptyness of the string to look the same in the code and makes it easier to port old code to wxString.

See also *IsEmpty()* (p. 1025).

wxString::operator =

wxString& operator =(**const wxString&** *str*)

wxString& operator =(**const char*** *psz*)

wxString& operator =(**char** *c*)

wxString& operator =(**const unsigned char*** *psz*)

wxString& operator =(**const wchar_t*** *pwz*)

Assignment: the effect of each operation is the same as for the corresponding constructor (see *wxString constructors* (p. 1019)).

wxString::operator +

Concatenation: all these operators return a new strign equal to the sum of the operands.

wxString operator +(**const wxString&** *x*, **const wxString&** *y*)

wxString operator +(**const wxString&** *x*, **const char*** *y*)

wxString operator +(**const wxString&** *x*, **char** *y*)

wxString operator +(**const char*** *x*, **const wxString&** *y*)

wxString::operator +=

void operator +=(**const wxString&** *str*)

void operator +=(**const char*** *psz*)

void operator +=(**char** *c*)

Concatenation in place: the argument is appended to the string.

wxString::operator []

char& operator [](**size_t** *i*)

char operator [](**size_t** *i*)

char operator [](**int** *i*)

Element extraction.

wxString::operator ()

wxString operator ()(**size_t** *start*, **size_t** *len*)

Same as Mid (substring extraction).

wxString::operator <<

wxString& operator <<(**const wxString&** *str*)

wxString& operator <<(**const char*** *psz*)

wxString& operator <<(**char** *ch*)

Same as +=.

wxString& operator <<(**int** *i*)

wxString& operator <<(**float** *f*)

wxString& operator <<(**double** *d*)

These functions work as C++ stream insertion operators: they insert the given value into the string. Precision or format cannot be set using them, you can use *Printf* (p. 1028) for this.

wxString::operator >>

friend istream& operator >>(**istream&** *is*, **wxString&** *str*)

Extraction from a stream.

wxString::operator const char*

operator const char*() **const**

Implicit conversion to a C string.

Comparison operators

bool operator ==(**const wxString&** *x*, **const wxString&** *y*)

bool operator ==(**const wxString&** *x*, **const char*** *t*)

bool operator !=(**const wxString&** *x*, **const wxString&** *y*)

bool operator !=(**const wxString&** *x*, **const char*** *t*)

bool operator >(**const wxString&** *x*, **const wxString&** *y*)

bool operator >(**const wxString&** *x*, **const char*** *t*)

bool operator >=(**const wxString&** *x*, **const wxString&** *y*)

bool operator >=(**const wxString&** *x*, **const char*** *t*)

bool operator <(**const wxString&** *x*, **const wxString&** *y*)

bool operator <(**const wxString&** *x*, **const char*** *t*)

bool operator <=(**const wxString&** *x*, **const wxString&** *y*)

bool operator <=(**const wxString&** *x*, **const char*** *t*)

Remarks

These comparisons are case-sensitive.

wxStringFormValidator

This class validates a string value for a form view, with an optional choice of possible values. The associated panel item must be a wxText, wxListBox or wxChoice. For wxListBox and wxChoice items, if the item is empty, the validator attempts to initialize the item from the strings in the validator. Note that this does not happen for XView wxChoice items since XView cannot reinitialize a wxChoice.

See also

Validator classes (p. 1463)

wxStringFormValidator::wxStringFormValidator

void wxStringFormValidator(**wxStringList** **list=NULL*, **long** *flags=0*)

Constructor. Supply a list of strings to indicate a choice, or no strings to allow the user to freely edit the string. The string list will be deleted when the validator is deleted.

wxStringList

A string list is a list which is assumed to contain strings. Memory is allocated when strings are added to the list, and deallocated by the destructor or by the **Delete** member.

Derived from

wxList (p. 619)
wxObject (p. 750)

Include files

<wx/list.h>

See also

wxString (p. 1011), *wxList* (p. 619)

wxStringList::wxStringList

wxStringList()

Constructor.

void wxStringList(**char*** *first*, ...)

Constructor, taking NULL-terminated string argument list. wxStringList allocates memory for the strings.

wxStringList::~wxStringList

~wxStringList()

Deletes string list, deallocating strings.

wxStringList::Add

wxNode * Add(**const wxString&** *s*)

Adds string to list, allocating memory.

wxStringList::Clear

void Clear()

Clears all strings from the list.

wxStringList::Delete

void Delete(**const wxString&** *s*)

Searches for string and deletes from list, deallocating memory.

wxStringList::ListToArray

char* ListToArray(**bool** *new_copies = FALSE*)

Converts the list to an array of strings, only allocating new memory if **new_copies** is TRUE.

wxStringList::Member

bool Member(**const wxString&** *s*)

Returns TRUE if **s** is a member of the list (tested using **strcmp**).

wxStringList::Sort

void Sort()

Sorts the strings in ascending alphabetical order. Note that all nodes (but not strings) get deallocated and new ones allocated.

wxStringListValidator

This class validates a string value, with an optional choice of possible values.

See also

Validator classes (p. 1463)

wxStringListValidator::wxStringListValidator

void wxStringListValidator(**wxStringList** **list=NULL*, **long** *flags=0*)

Constructor. Supply a list of strings to indicate a choice, or no strings to allow the user to freely edit the string. The string list will be deleted when the validator is deleted.

wxStringTokenizer

wxStringTokenizer helps you to break a string up into a number of tokens. It replaces the standard C function `strtok()` and also extends it in a number of ways.

To use this class, you should create a wxStringTokenizer object, give it the string to tokenize and also the delimiters which separate tokens in the string (by default, white space characters will be used).

Then *GetNextToken* (p. 1039) may be called repeatedly until it *HasMoreTokens* (p. 1038) returns FALSE.

For example:

```
wxStringTokenizer tkz("first:second:third:fourth", ":");
while ( tkz.HasMoreTokens() )
{
    wxString token = tkz.GetNextToken();

    // process token here
}
```

By default, wxStringTokenizer will behave in the same way as `strtok()` if the delimiters string only contains white space characters but, unlike the standard function, it will return empty tokens if this is not the case. This is helpful for parsing strictly formatted data where the number of fields is fixed but some of them may be empty (i.e. `TAB` or comma delimited text files).

The behaviour is governed by the last *constructor* (p. 1038)/*SetString* (p. 1039) parameter `mode` which may be one of the following:

`wxTOKEN_DEFAULT`	Default behaviour (as described above): same as `wxTOKEN_STRTOK` if the delimiter string contains only whitespaces, same as `wxTOKEN_RET_EMPTY` otherwise

wxTOKEN_RET_EMPTY	In this mode, the empty tokens in the middle of the string will be returned, i.e. `"a::b:"` will be tokenized in three tokens 'a', '' and 'b'.
wxTOKEN_RET_EMPTY_ALL	In this mode, empty trailing token (after the last delimiter character) will be returned as well. The string as above will contain four tokens: the already mentioned ones and another empty one as the last one.
wxTOKEN_RET_DELIMS	In this mode, the delimiter character after the end of the current token (there may be none if this is the last token) is returned appended to the token. Otherwise, it is the same mode as wxTOKEN_RET_EMPTY.
wxTOKEN_STRTOK	In this mode the class behaves exactly like the standard strtok() function. The empty tokens are never returned.

Derived from

wxObject (p. 750)

Include files

<wx/tokenzr.h>

wxStringTokenizer::wxStringTokenizer

wxStringTokenizer()

Default constructor. You must call *SetString* (p. 1039) before calling any other methods.

wxStringTokenizer(**const wxString&** *str*, **const wxString&** *delims = " \t\r\n"*, **wxStringTokenizerMode** *mode = wxTOKEN_DEFAULT*)

Constructor. Pass the string to tokenize, a string containing delimiters and the mode specifying how the string should be tokenized.

wxStringTokenizer::CountTokens

int CountTokens() **const**

Returns the number of tokens in the input string.

wxStringTokenizer::HasMoreTokens

bool HasMoreTokens() **const**

Returns TRUE if the tokenizer has further tokens, FALSE if none are left.

wxStringTokenizer::GetNextToken

wxString GetNextToken()

Returns the next token or empty string if the end of string was reached.

wxStringTokenizer::GetPosition

size_t GetPosition() const

Returns the current position (i.e. one index after the last returned token or 0 if GetNextToken() has never been called) in the original string.

wxStringTokenizer::GetString

wxString GetString() const

Returns the part of the starting string without all token already extracted.

wxStringTokenizer::SetString

void SetString(const wxString& *to_tokenize*, const wxString& *delims = " \t\r\n"*, wxStringTokenizerMode *mode = wxTOKEN_DEFAULT*)

Initializes the tokenizer.

Pass the string to tokenize, a string containing delimiters, and the mode specifying how the string should be tokenized.

wxSysColourChangedEvent

This class is used for system colour change events, which are generated when the user changes the colour settings using the control panel. This is only appropriate under Windows.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process a system colour changed event, use this event handler macro to direct input to a member function that takes a wxSysColourChanged argument.

EVT_SYS_COLOUR_CHANGED(func) Process a wxEVT_SYS_COLOUR_CHANGED
event.

Remarks

The default event handler for this event propagates the event to child windows, since Windows only sends the events to top-level windows. If intercepting this event for a top-level window, remember to call the base class handler, or to pass the event on to the window's children explicitly.

See also

wxWindow::OnSysColourChanged (p. 1222), *Event handling overview* (p. 1372)

wxSysColourChangedEvent::wxSysColourChanged

 wxSysColourChanged()

Constructor.

wxSystemSettings

wxSystemSettings allows the application to ask for details about the system. This can include settings such as standard colours, fonts, and user interface element sizes.

Derived from

wxObject (p. 750)

Include files

<wx/settings.h>

See also

wxFont (p. 437), *wxColour* (p. 136)

wxSystemSettings::wxSystemSettings

wxSystemSettings()

Default constructor. You don't need to create an instance of wxSystemSettings since all of its functions are static.

wxSystemSettings::GetSystemColour

static wxColour GetSystemColour(**int** *index*)

Returns a system colour.

index can be one of:

wxSYS_COLOUR_SCROLLBAR	The scrollbar grey area.
wxSYS_COLOUR_BACKGROUND	The desktop colour.
wxSYS_COLOUR_ACTIVECAPTION	Active window caption.
wxSYS_COLOUR_INACTIVECAPTION	Inactive window caption.
wxSYS_COLOUR_MENU	Menu background.
wxSYS_COLOUR_WINDOW	Window background.
wxSYS_COLOUR_WINDOWFRAME	Window frame.
wxSYS_COLOUR_MENUTEXT	Menu text.
wxSYS_COLOUR_WINDOWTEXT	Text in windows.
wxSYS_COLOUR_CAPTIONTEXT	Text in caption, size box and scrollbar arrow box.
wxSYS_COLOUR_ACTIVEBORDER	Active window border.
wxSYS_COLOUR_INACTIVEBORDER	Inactive window border.
wxSYS_COLOUR_APPWORKSPACE	Background colour MDI applications.
wxSYS_COLOUR_HIGHLIGHT	Item(s) selected in a control.
wxSYS_COLOUR_HIGHLIGHTTEXT	Text of item(s) selected in a control.
wxSYS_COLOUR_BTNFACE	Face shading on push buttons.
wxSYS_COLOUR_BTNSHADOW	Edge shading on push buttons.
wxSYS_COLOUR_GRAYTEXT	Greyed (disabled) text.
wxSYS_COLOUR_BTNTEXT	Text on push buttons.
wxSYS_COLOUR_INACTIVECAPTIONTEXT	Colour of text in active captions.
wxSYS_COLOUR_BTNHIGHLIGHT	Highlight colour for buttons (same as wxSYS_COLOUR_3DHILIGHT).
wxSYS_COLOUR_3DDKSHADOW	Dark shadow for three-dimensional dispaly elements.
wxSYS_COLOUR_3DLIGHT	Light colour for three-dimensional display elements.
wxSYS_COLOUR_INFOTEXT	Text colour for tooltip controls.

wxSYS_COLOUR_INFOBK	Background colour for tooltip controls.
wxSYS_COLOUR_DESKTOP	Same as wxSYS_COLOUR_BACKGROUND.
wxSYS_COLOUR_3DFACE	Same as wxSYS_COLOUR_BTNFACE.
wxSYS_COLOUR_3DSHADOW	Same as wxSYS_COLOUR_BTNSHADOW.
wxSYS_COLOUR_3DHIGHLIGHT	Same as wxSYS_COLOUR_BTNHIGHLIGHT.
wxSYS_COLOUR_3DHILIGHT	Same as wxSYS_COLOUR_BTNHIGHLIGHT.
wxSYS_COLOUR_BTNHILIGHT	Same as wxSYS_COLOUR_BTNHIGHLIGHT.

wxPython note: This static method is implemented in Python as a standalone function named `wxSystemSettings_GetSystemColour`

wxSystemSettings::GetSystemFont

static wxFont GetSystemFont(**int** *index*)

Returns a system font.

index can be one of:

wxSYS_OEM_FIXED_FONT	Original equipment manufacturer dependent fixed-pitch font.
wxSYS_ANSI_FIXED_FONT	Windows fixed-pitch font.
wxSYS_ANSI_VAR_FONT	Windows variable-pitch (proportional) font.
wxSYS_SYSTEM_FONT	System font.
wxSYS_DEVICE_DEFAULT_FONT	Device-dependent font (Windows NT only).
wxSYS_DEFAULT_GUI_FONT	Default font for user interface objects such as menus and dialog boxes. Not available in versions of Windows earlier than Windows 95 or Windows NT 4.0.

wxPython note: This static method is implemented in Python as a standalone function named `wxSystemSettings_GetSystemFont`

wxSystemSettings::GetSystemMetric

static int GetSystemMetric(**int** *index*)

Returns a system metric.

index can be one of:

wxSYS_MOUSE_BUTTONS	Number of buttons on mouse, or zero if no mouse was installed.
wxSYS_BORDER_X	Width of single border.
wxSYS_BORDER_Y	Height of single border.
wxSYS_CURSOR_X	Width of cursor.

wxSYS_CURSOR_Y	Height of cursor.
wxSYS_DCLICK_X	Width in pixels of rectangle within which two successive mouse clicks must fall to generate a double-click.
wxSYS_DCLICK_Y	Height in pixels of rectangle within which two successive mouse clicks must fall to generate a double-click.
wxSYS_DRAG_X	Width in pixels of a rectangle centered on a drag point to allow for limited movement of the mouse pointer before a drag operation begins.
wxSYS_DRAG_Y	Height in pixels of a rectangle centered on a drag point to allow for limited movement of the mouse pointer before a drag operation begins.
wxSYS_EDGE_X	Width of a 3D border, in pixels.
wxSYS_EDGE_Y	Height of a 3D border, in pixels.
wxSYS_HSCROLL_ARROW_X	Width of arrow bitmap on horizontal scrollbar.
wxSYS_HSCROLL_ARROW_Y	Height of arrow bitmap on horizontal scrollbar.
wxSYS_HTHUMB_X	Width of horizontal scrollbar thumb.
wxSYS_ICON_X	The default width of an icon.
wxSYS_ICON_Y	The default height of an icon.
wxSYS_ICONSPACING_X	Width of a grid cell for items in large icon view, in pixels. Each item fits into a rectangle of this size when arranged.
wxSYS_ICONSPACING_Y	Height of a grid cell for items in large icon view, in pixels. Each item fits into a rectangle of this size when arranged.
wxSYS_WINDOWMIN_X	Minimum width of a window.
wxSYS_WINDOWMIN_Y	Minimum height of a window.
wxSYS_SCREEN_X	Width of the screen in pixels.
wxSYS_SCREEN_Y	Height of the screen in pixels.
wxSYS_FRAMESIZE_X	Width of the window frame for a wxTHICK_FRAME window.
wxSYS_FRAMESIZE_Y	Height of the window frame for a wxTHICK_FRAME window.
wxSYS_SMALLICON_X	Recommended width of a small icon (in window captions, and small icon view).
wxSYS_SMALLICON_Y	Recommended height of a small icon (in window captions, and small icon view).
wxSYS_HSCROLL_Y	Height of horizontal scrollbar in pixels.
wxSYS_VSCROLL_X	Width of vertical scrollbar in pixels.
wxSYS_VSCROLL_ARROW_X	Width of arrow bitmap on a vertical scrollbar.
wxSYS_VSCROLL_ARROW_Y	Height of arrow bitmap on a vertical scrollbar.
wxSYS_VTHUMB_Y	Height of vertical scrollbar thumb.
wxSYS_CAPTION_Y	Height of normal caption area.
wxSYS_MENU_Y	Height of single-line menu bar.
wxSYS_NETWORK_PRESENT	1 if there is a network present, 0 otherwise.
wxSYS_PENWINDOWS_PRESENT	1 if PenWindows is installed, 0 otherwise.
wxSYS_SHOW_SOUNDS	Non-zero if the user requires an application to present information visually in situations where it would otherwise present the information only in audible form; zero otherwise.

wxSYS_SWAP_BUTTONS	Non-zero if the meanings of the left and right mouse buttons are swapped; zero otherwise.

wxPython note: This static method is implemented in Python as a standalone function named `wxSystemSettings_GetSystemMetric`

wxTabbedDialog

A dialog suitable for handling tabs.

Please note that the preferred class for programming tabbed windows is *wxNotebook* (p. 741). This class is retained for backward compatibility.

Derived from

wxDialog (p. 312)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/tab.h>

See also

Tab classes overview (p. 1417)

wxTabbedDialog::wxTabbedDialog

 wxTabbedDialog(**wxWindow** *parent, **wxWindowID** *id*, **const wxString&** *title*, **const wxPoint&** *pos*, **const wxSize&** *size*, **long** *style=wxDEFAULT_DIALOG_STYLE*, **const wxString&** *name="dialogBox"*)

Constructor.

wxTabbedDialog::~wxTabbedDialog

 ~wxTabbedDialog()

Destructor. This destructor deletes the tab view associated with the dialog box. If you do not wish this to happen, set the tab view to NULL before destruction (for example, in the OnCloseWindow event handler).

wxTabbedDialog::SetTabView

void SetTabView(**wxTabView** *view)

Sets the tab view associated with the dialog box.

wxTabbedDialog::GetTabView

wxTabView * GetTabView()

Returns the tab view associated with the dialog box.

wxTabbedPanel

A panel suitable for handling tabs.

Please note that the preferred class for programming tabbed windows is *wxNotebook* (p. 741). This class is retained for backward compatibility.

Derived from

wxPanel (p. 769)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/tab.h>

See also

Tab classes overview (p. 1417)

wxTabbedPanel::wxTabbedPanel

 wxTabbedPanel(**wxWindow** *parent, **wxWindowID** *id*, **const wxPoint&** *pos*, **const wxSize&** *size*, **long** *style=0*, **const wxString&** *name="panel"*)

Constructor.

wxTabbedPanel::SetTabView

void SetTabView(**wxTabView** *view)

Sets the tab view associated with the panel.

wxTabbedPanel::GetTabView

wxTabView * GetTabView()

Returns the tab view associated with the panel.

wxTabControl

You will rarely need to use this class directly.

Please note that the preferred class for programming tabbed windows is *wxNotebook* (p. 741). This class is retained for backward compatibility.

Derived from

wxObject (p. 750)

Include files

<wx/tab.h>

See also

Tab classes overview (p. 1417)

wxTabControl::wxTabControl

void wxTabControl(**wxTabView** **view = NULL*)

Constructor.

wxTabControl::GetColPosition

int GetColPosition()

Returns the position of the tab in the tab column.

wxTabControl::GetFont

wxFont * GetFont()

Returns the font to be used for this tab.

wxTabControl::GetHeight

int GetHeight()

Returns the tab height.

wxTabControl::GetId

int GetId()

Returns the tab identifier.

wxTabControl::GetLabel

wxString GetLabel()

Returns the tab label.

wxTabControl::GetRowPosition

int GetRowPosition()

Returns the position of the tab in the layer or row.

wxTabControl::GetSelected

bool GetSelected()

Returns the selected flag.

wxTabControl::GetWidth

int GetWidth()

Returns the tab width.

wxTabControl::GetX

int GetX()

Returns the x offset from the top-left of the view area.

wxTabControl::GetY

int GetY()

Returns the y offset from the top-left of the view area.

wxTabControl::HitTest

bool HitTest(**int** *x*, **int** *y*)

Returns TRUE if the point x, y is within the tab area.

wxTabControl::OnDraw

void OnDraw(**wxDC&** *dc*, **bool** *lastInRow*)

Draws the tab control on the given device context.

wxTabControl::SetColPosition

void SetColPosition(**int** *pos*)

Sets the position in the column.

wxTabControl::SetFont

void SetFont(**wxFont ****font*)

Sets the font to be used for this tab.

wxTabControl::SetId

void SetId(**int** *id*)

Sets the tab identifier.

wxTabControl::SetLabel

void SetLabel(**const wxString&** *str*)

Sets the label for the tab.

wxTabControl::SetPosition

void SetPosition(**int** *x*, **int** *y*)

Sets the x and y offsets for this tab, measured from the top-left of the view area.

wxTabControl::SetRowPosition

void SetRowPosition(**int** *pos*)

Sets the position on the layer (row).

wxTabControl::SetSelected

void SetSelected(**bool** *selected*)

Sets the selection flag for this tab (does not set the current tab for the view; use wxTabView::SetSelectedTab for that).

wxTabControl::SetSize

void SetSize(**int** *width*, **int** *height*)

Sets the width and height for this tab.

wxTabView

Responsible for drawing tabs onto a window, and dealing with input.

Please note that the preferred class for programming tabbed windows is *wxNotebook* (p. 741). This class is retained for backward compatibility.

Derived from

wxObject (p. 750)

Include files

<wx/tab.h>

See also

wxTabView overview (p. 1421), *wxPanelTabView* (p. 772)

wxTabView::wxTabView

wxTabView(**long** *style = wxTAB_STYLE_DRAW_BOX |
wxTAB_STYLE_COLOUR_INTERIOR*)

Constructor.

style may be a bit list of the following:

wxTAB_STYLE_DRAW_BOX	Draw a box around the view area. Most commonly used for dialogs.
wxTAB_STYLE_COLOUR_INTERIOR	Draw tab backgrounds in the specified colour. Omitting this style will ensure that the tab background matches the dialog background.

wxTabView::AddTab

wxTabControl * AddTab(**int** *id*, **const wxString&** *label*, **wxTabControl
****existingTab=NULL*)

Adds a tab to the view.

id is the application-chosen identifier for the tab, which will be used in subsequent tab operations.

label is the label to give the tab.

existingTab maybe NULL to specify a new tab, or non-NULL to indicate that an existing tab should be used.

A new layer (row) is started when the current layer has been filled up with tabs.

wxTabView::CalculateTabWidth

int CalculateTabWidth(**int** *noTabs*, **bool** *adjustView = FALSE*)

The application can specify the tab width using this function, in terms of the number of tabs per layer (row) which will fit the view area, which should have been set previously with SetViewRect.

noTabs is the number of tabs which should take up the full width of the view area.

adjustView can be set to TRUE in order to readjust the view width to exactly fit the given number of tabs.

The new tab width is returned.

wxTabView::ClearTabs

void ClearTabs(**bool** *deleteTabs=TRUE*)

Clears the tabs, deleting them if *deleteTabs* is TRUE.

wxTabView::Draw

void Draw(**wxDC&** *dc*)

Draws the tabs and (optionally) a box around the view area.

wxTabView::FindTabControlForId

wxTabControl * FindTabControlForId(**int** *id*)

Finds the wxTabControl corresponding to *id*.

wxTabView::FindTabControlForPosition

wxTabControl * FindTabControlForPosition(**int** *layer*, **int** *position*)

Finds the wxTabControl at layer *layer*, position in layer *position*, both starting from zero. Note that tabs change layer as they are selected or deselected.

wxTabView::GetBackgroundBrush

wxBrush * GetBackgroundBrush()

Returns the brush used to draw in the background colour. It is set when SetBackgroundColour is called.

wxTabView::GetBackgroundColour

wxColour GetBackgroundColour()

Returns the colour used for each tab background. By default, this is light grey. To ensure a match with the dialog or panel background, omit the wxTAB_STYLE_COLOUR_INTERIOR flag from the wxTabView constructor.

wxTabView::GetBackgroundPen

wxPen * GetBackgroundPen()

Returns the pen used to draw in the background colour. It is set when SetBackgroundColour is called.

wxTabView::GetHighlightColour

wxColour GetHighlightColour()

Returns the colour used for bright highlights on the left side of '3D' surfaces. By default, this is white.

wxTabView::GetHighlightPen

wxPen * GetHighlightPen()

Returns the pen used to draw 3D effect highlights. This is set when SetHighlightColour is called.

wxTabView::GetHorizontalTabOffset

int GetHorizontalTabOffset()

Returns the horizontal spacing by which each tab layer is offset from the one below.

wxTabView::GetNumberOfLayers

int GetNumberOfLayers()

Returns the number of layers (rows of tabs).

wxTabView::GetSelectedTabFont

wxFont * GetSelectedTabFont()

Returns the font to be used for the selected tab label.

wxTabView::GetShadowColour

wxColour GetShadowColour()

Returns the colour used for shadows on the right-hand side of '3D' surfaces. By default, this is dark grey.

wxTabView::GetTabHeight

int GetTabHeight()

Returns the tab default height.

wxTabView::GetTabFont

wxFont * GetTabFont()

Returns the tab label font.

wxTabView::GetTabSelectionHeight

int GetTabSelectionHeight()

Returns the height to be used for the currently selected tab; normally a few pixels higher than the other tabs.

wxTabView::GetTabStyle

long GetTabStyle()

Returns the tab style. See constructor documentation for details of valid styles.

wxTabView::GetTabWidth

int GetTabWidth()

Returns the tab default width.

wxTabView::GetTextColour

wxColour GetTextColour()

Returns the colour used to draw label text. By default, this is black.

wxTabView::GetTopMargin

int GetTopMargin()

Returns the height between the top of the view area and the bottom of the first row of tabs.

wxTabView::GetShadowPen

wxPen * GetShadowPen()

Returns the pen used to draw 3D effect shadows. This is set when SetShadowColour is called.

wxTabView::GetViewRect

wxRectangle GetViewRect()

Returns the rectangle specifying the view area (above which tabs are placed).

wxTabView::GetVerticalTabTextSpacing

int GetVerticalTabTextSpacing()

Returns the vertical spacing between the top of an unselected tab, and the tab label.

wxTabView::GetWindow

wwxWindow * GetWindow()

Returns the window for the view.

wxTabView::OnCreateTabControl

wxTabControl * OnCreateTabControl()

Creates a new tab control. By default, this returns a wxTabControl object, but the application may wish to define a derived class, in which case the tab view should be subclassed and this function overridden.

wxTabView::LayoutTabs

void LayoutTabs()

Recalculates the positions of the tabs, and adjusts the layer of the selected tab if necessary.

You may want to call this function if the view width has changed (for example, from an OnSize handler).

wxTabView::OnEvent

bool OnEvent(**wxMouseEvent&** *event*)

Processes mouse events sent from the panel or dialog. Returns TRUE if the event was processed, FALSE otherwise.

wxTabView::OnTabActivate

void OnTabActivate(**int** *activateId*, **int** *deactivateId*)

Called when a tab is activated, with the new active tab id, and the former active tab id.

wxTabView::OnTabPreActivate

bool OnTabPreActivate(**int** *activateId*, **int** *deactivateId*)

Called just before a tab is activated, with the new active tab id, and the former active tab id.

If the function returns FALSE, the tab is not activated.

wxTabView::SetBackgroundColour

void SetBackgroundColour(**const wxColour&** *col*)

Sets the colour to be used for each tab background. By default, this is light grey. To ensure a match with the dialog or panel background, omit the wxTAB_STYLE_COLOUR_INTERIOR flag from the wxTabView constructor.

wxTabView::SetHighlightColour

void SetHighlightColour(const wxColour& *col*)

Sets the colour to be used for bright highlights on the left side of '3D' surfaces. By default, this is white.

wxTabView::SetHorizontalTabOffset

void SetHorizontalTabOffset(int *offset*)

Sets the horizontal spacing by which each tab layer is offset from the one below.

wxTabView::SetSelectedTabFont

void SetSelectedTabFont(wxFont **font*)

Sets the font to be used for the selected tab label.

wxTabView::SetShadowColour

void SetShadowColour(const wxColour& *col*)

Sets the colour to be used for shadows on the right-hand side of '3D' surfaces. By default, this is dark grey.

wxTabView::SetTabFont

void SetTabFont(wxFont **font*)

Sets the tab label font.

wxTabView::SetTabStyle

void SetTabStyle(long *tabStyle*)

Sets the tab style. See constructor documentation for details of valid styles.

wxTabView::SetTabSize

void SetTabSize(int *width*, int *height*)

Sets the tab default width and height.

wxTabView::SetTabSelectionHeight

void SetTabSelectionHeight(int *height*)

Sets the height to be used for the currently selected tab; normally a few pixels higher than the other tabs.

wxTabView::SetTabSelection

void SetTabSelection(int *sel*, bool *activateTool=TRUE*)

Sets the selected tab, calling the application's OnTabActivate function.

If *activateTool* is FALSE, OnTabActivate will not be called.

wxTabView::SetTextColour

void SetTextColour(const wxColour& *col*)

Sets the colour to be used to draw label text. By default, this is black.

wxTabView::SetTopMargin

void SetTopMargin(int *margin*)

Sets the height between the top of the view area and the bottom of the first row of tabs.

wxTabView::SetVerticalTabTextSpacing

void SetVerticalTabTextSpacing(int *spacing*)

Sets the vertical spacing between the top of an unselected tab, and the tab label.

wxTabView::SetViewRect

void SetViewRect(const wxRectangle& *rect*)

Sets the rectangle specifying the view area (above which tabs are placed). This must be set by the application.

wxTabView::SetWindow

void SetWindow(**wxWindow** * *window*)

Set the window that the tab view will use for drawing onto.

wxTabCtrl

This class represents a tab control, which manages multiple tabs.

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/tabctrl.h>

See also

wxTabEvent (p. 1063), *wxImageList* (p. 587), *wxNotebook* (p. 741)

wxTabCtrl::wxTabCtrl

wxTabCtrl()

Default constructor.

wxTabCtrl(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size*, **long** *style* = *0*, **const wxString&** *name* = *"tabCtrl"*)

Constructs a tab control.

Parameters

parent
  The parent window. Must be non-NULL.

id
  The window identifier.

pos

The window position.

size

The window size.

style

The window style. Its value is a bit list of zero or more of **wxTC_MULTILINE**, **wxTC_RIGHTJUSTIFY**, **wxTC_FIXEDWIDTH** and **wxTC_OWNERDRAW**.

wxTabCtrl::~wxTabCtrl

~wxTabCtrl()

Destroys the wxTabCtrl object.

wxTabCtrl::Create

bool Create(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size*, **long** *style = 0*, **const wxString&** *name = "tabCtrl"*)

Creates a tab control. See *wxTabCtrl::wxTabCtrl* (p. 1058) for a description of the parameters.

wxTabCtrl::DeleteAllItems

bool DeleteAllItems()

Deletes all tab items.

wxTabCtrl::DeleteItem

bool DeleteItem(**int** *item*)

Deletes the specified tab item.

wxTabCtrl::GetCurFocus

int GetCurFocus() **const**

Returns the index for the tab with the focus, or -1 if none has the focus.

wxTabCtrl::GetImageList

wxImageList* GetImageList() **const**

Returns the associated image list.

See also

wxImageList (p. 587), *wxTabCtrl::SetImageList* (p. 1062)

wxTabCtrl::GetItemCount

int GetItemCount() **const**

Returns the number of tabs in the tab control.

wxTabCtrl::GetItemData

void* GetItemData() **const**

Returns the client data for the given tab.

wxTabCtrl::GetItemImage

int GetItemImage() **const**

Returns the image index for the given tab.

wxTabCtrl::GetItemRect

bool GetItemRect(**int** *item*, **wxRect&** *rect*) **const**

Returns the rectangle bounding the given tab.

See also

wxRect (p. 873)

wxTabCtrl::GetItemText

wxString GetItemText() **const**

Returns the string for the given tab.

wxTabCtrl::GetRowCount

int GetRowCount() const

Returns the number of rows in the tab control.

wxTabCtrl::GetSelection

int GetSelection() const

Returns the index for the currently selected tab.

See also

wxTabCtrl::SetSelection (p. 1063)

wxTabCtrl::HitTest

int HitTest(const wxPoint& *pt*, long& *flags*)

Tests whether a tab is at the specified position.

Parameters

pt
Specifies the point for the hit test.

flags
Return value for detailed information. One of the following values:

wxTAB_HITTEST_NOWHERE	There was no tab under this point.
wxTAB_HITTEST_ONICON	The point was over an icon.
wxTAB_HITTEST_ONLABEL	The point was over a label.
wxTAB_HITTEST_ONITEM	The point was over an item, but not on the label or icon.

Return value

Returns the zero-based tab index or -1 if no tab is at the specified position.

wxTabCtrl::InsertItem

void InsertItem(int *item*, const wxString& *text*, int *imageId = -1*, void* *clientData = NULL*)

Inserts a new tab.

Parameters

item
Specifies the index for the new item.

text
Specifies the text for the new item.

imageId
Specifies the optional image index for the new item.

clientData
Specifies the optional client data for the new item.

Return value

TRUE if successful, FALSE otherwise.

wxTabCtrl::SetItemData

bool SetItemData(**int** *item*, **void*** *data*)

Sets the client data for a tab.

wxTabCtrl::SetItemImage

bool SetItemImage(**int** *item*, **int** *image*)

Sets the image index for the given tab. *image* is an index into the image list which was set with *wxTabCtrl::SetImageList* (p. 1062).

wxTabCtrl::SetImageList

void SetImageList(**wxImageList*** *imageList*)

Sets the image list for the tab control.

See also

wxImageList (p. 587)

wxTabCtrl::SetItemSize

void SetItemSize(**const wxSize&** *size*)

Sets the width and height of the tabs.

wxTabCtrl::SetItemText

bool SetItemText(**int** *item*, **const wxString&** *text*)

Sets the text for the given tab.

wxTabCtrl::SetPadding

void SetPadding(**const wxSize&** *padding*)

Sets the amount of space around each tab's icon and label.

wxTabCtrl::SetSelection

int SetSelection(**int** *item*)

Sets the selection for the given tab, returning the index of the previously selected tab. Returns -1 if the call was unsuccessful.

See also

wxTabCtrl::GetSelection (p. 1061)

wxTabEvent

This class represents the events generated by a tab control.

Derived from

wxCommandEvent (p. 153)
wxEvent (p. 377)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/tabctrl.h>

Event table macros

To process a tab event, use these event handler macros to direct input to member

functions that take a wxTabEvent argument.

EVT_TAB_SEL_CHANGED(id, func)	Process a wxEVT_TAB_SEL_CHANGED event, indicating that the tab selection has changed.
EVT_TAB_SEL_CHANGING(id, func)	Process a wxEVT_TAB_SEL_CHANGING event, indicating that the tab selection is changing.

See also

wxTabCtrl (p. 1058)

wxTabEvent::wxTabEvent

wxTabEvent(**WXTYPE** *commandType = 0,* **int** *id = 0*)

Constructor.

wxTaskBarIcon

This class represents a Windows 95 taskbar icon, appearing in the 'system tray' and responding to mouse clicks. An icon has an optional tooltip. This class is only supported for Windows 95/NT.

Derived from

wxObject (p. 750)

Include files

<wx/taskbar.h>

wxTaskBarIcon::wxTaskBarIcon

wxTaskBarIcon()

Default constructor.

wxTaskBarIcon::~wxTaskBarIcon

~wxTaskBarIcon()

Destroys the wxTaskBarIcon object, removing the icon if not already removed.

wxTaskBarIcon::IsIconInstalled

bool IsIconInstalled()

Returns TRUE if *SetIcon* (p. 1066) was called with no subsequent *RemoveIcon* (p. 1066).

wxTaskBarIcon::IsOK

bool IsOK()

Returns TRUE if the object initialized successfully.

wxTaskBarIcon::OnLButtonDown

virtual void OnLButtonDown()

Override this function to intercept left mouse button down events.

wxTaskBarIcon::OnLButtonDClick

virtual void OnLButtonDClick()

Override this function to intercept left mouse button double-click events.

wxTaskBarIcon::OnLButtonUp

virtual void OnLButtonUp()

Override this function to intercept left mouse button up events.

wxTaskBarIcon::OnRButtonDown

virtual void OnRButtonDown()

Override this function to intercept right mouse button down events.

wxTaskBarIcon::OnRButtonDClick

virtual void OnRButtonDClick()

Override this function to intercept right mouse button double-click events.

wxTaskBarIcon::OnRButtonUp

virtual void OnRButtonUp()

Override this function to intercept right mouse button up events.

wxTaskBarIcon::OnMouseMove

virtual void OnMouseMove()

Override this function to intercept mouse move events.

wxTaskBarIcon::RemoveIcon

bool RemoveIcon()

Removes the icon previously set with *SetIcon* (p. 1066).

wxTaskBarIcon::SetIcon

bool SetIcon(**const wxIcon&** *icon*, **const wxString&** *tooltip*)

Sets the icon, and optional tooltip text.

wxTCPClient

A wxTCPClient object represents the client part of a client-server conversation. It emulates a DDE-style protocol, but uses TCP/IP which is available on most platforms.

A DDE-based implementation for Windows is available using *wxDDEClient* (p. 300).

To create a client which can communicate with a suitable server, you need to derive a class from wxTCPConnection and another from wxTCPClient. The custom wxTCPConnection class will intercept communications in a 'conversation' with a server, and the custom wxTCPServer is required so that a user-overridden

wxTCPClient::OnMakeConnection (p. 1067) member can return a wxTCPConnection of the required class, when a connection is made.

Derived from

wxClientBase
wxObject (p. 750)

Include files

<wx/sckipc.h>

See also

wxTCPServer (p. 1072), *wxTCPConnection* (p. 1068), *Interprocess communications overview* (p. 1438)

wxTCPClient::wxTCPClient

 wxTCPClient()

Constructs a client object.

wxTCPClient::MakeConnection

wxConnectionBase * MakeConnection(**const wxString&** *host*, **const wxString&** *service*, **const wxString&** *topic*)

Tries to make a connection with a server specified by the host (a machine name under Unix), service name (must contain an integer port number under Unix), and a topic string. If the server allows a connection, a wxTCPConnection object will be returned. The type of wxTCPConnection returned can be altered by overriding the *wxTCPClient::OnMakeConnection* (p. 1067) member to return your own derived connection object.

wxTCPClient::OnMakeConnection

wxConnectionBase * OnMakeConnection()

The type of *wxTCPConnection* (p. 1068) returned from a *wxTCPClient::MakeConnection* (p. 1067) call can be altered by deriving the **OnMakeConnection** member to return your own derived connection object. By default, a wxTCPConnection object is returned.

The advantage of deriving your own connection class is that it will enable you to intercept messages initiated by the server, such as *wxTCPConnection::OnAdvise* (p.

1070). You may also want to store application-specific data in instances of the new class.

wxTCPClient::ValidHost

bool ValidHost(**const wxString&** *host*)

Returns TRUE if this is a valid host name, FALSE otherwise.

wxTCPConnection

A wxTCPClient object represents the connection between a client and a server. It emulates a DDE-style protocol, but uses TCP/IP which is available on most platforms.

A DDE-based implementation for Windows is available using *wxDDEConnection* (p. 301).

A wxTCPConnection object can be created by making a connection using a *wxTCPClient* (p. 1066) object, or by the acceptance of a connection by a *wxTCPServer* (p. 1072) object. The bulk of a conversation is controlled by calling members in a **wxTCPConnection** object or by overriding its members.

An application should normally derive a new connection class from wxTCPConnection, in order to override the communication event handlers to do something interesting.

Derived from

wxConnectionBase
wxObject (p. 750)

Include files

<wx/sckipc.h>

Types

wxIPCFormat is defined as follows:

```
enum wxIPCFormat
{
  wxIPC_INVALID =            0,
  wxIPC_TEXT =               1,  /* CF_TEXT */
  wxIPC_BITMAP =             2,  /* CF_BITMAP */
  wxIPC_METAFILE =           3,  /* CF_METAFILEPICT */
  wxIPC_SYLK =               4,
  wxIPC_DIF =                5,
  wxIPC_TIFF =               6,
```

```
  wxIPC_OEMTEXT =              7,   /* CF_OEMTEXT */
  wxIPC_DIB =                  8,   /* CF_DIB */
  wxIPC_PALETTE =              9,
  wxIPC_PENDATA =              10,
  wxIPC_RIFF =                 11,
  wxIPC_WAVE =                 12,
  wxIPC_UNICODETEXT =          13,
  wxIPC_ENHMETAFILE =          14,
  wxIPC_FILENAME =             15,  /* CF_HDROP */
  wxIPC_LOCALE =               16,
  wxIPC_PRIVATE =              20
};
```

See also

wxTCPClient (p. 1066), *wxTCPServer* (p. 1072), *Interprocess communications overview* (p. 1438)

wxTCPConnection::wxTCPConnection

wxTCPConnection()

wxTCPConnection(**char*** *buffer*, **int** *size*)

Constructs a connection object. If no user-defined connection object is to be derived from wxTCPConnection, then the constructor should not be called directly, since the default connection object will be provided on requesting (or accepting) a connection. However, if the user defines his or her own derived connection object, the *wxTCPServer::OnAcceptConnection* (p. 1073) and/or *wxTCPClient::OnMakeConnection* (p. 1067) members should be replaced by functions which construct the new connection object. If the arguments of the wxTCPConnection constructor are void, then a default buffer is associated with the connection. Otherwise, the programmer must provide a a buffer and size of the buffer for the connection object to use in transactions.

wxTCPConnection::Advise

bool Advise(**const wxString&** *item*, **char*** *data*, **int** *size = -1*, **wxIPCFormat** *format = wxCF_TEXT*)

Called by the server application to advise the client of a change in the data associated with the given item. Causes the client connection's *wxTCPConnection::OnAdvise* (p. 1070) member to be called. Returns TRUE if successful.

wxTCPConnection::Execute

bool Execute(**char*** *data*, **int** *size = -1*, **wxIPCFormat** *format = wxCF_TEXT*)

Called by the client application to execute a command on the server. Can also be used to transfer arbitrary data to the server (similar to *wxTCPConnection::Poke* (p. 1071) in that respect). Causes the server connection's *wxTCPConnection::OnExecute* (p. 1070) member to be called. Returns TRUE if successful.

wxTCPConnection::Disconnect

bool Disconnect()

Called by the client or server application to disconnect from the other program; it causes the *wxTCPConnection::OnDisconnect* (p. 1070) message to be sent to the corresponding connection object in the other program. The default behaviour of **OnDisconnect** is to delete the connection, but the calling application must explicitly delete its side of the connection having called **Disconnect**. Returns TRUE if successful.

wxTCPConnection::OnAdvise

virtual bool OnAdvise(**const wxString&** *topic*, **const wxString&** *item*, **char*** *data*, **int** *size*, **wxIPCFormat** *format*)

Message sent to the client application when the server notifies it of a change in the data associated with the given item.

wxTCPConnection::OnDisconnect

virtual bool OnDisconnect()

Message sent to the client or server application when the other application notifies it to delete the connection. Default behaviour is to delete the connection object.

wxTCPConnection::OnExecute

virtual bool OnExecute(**const wxString&** *topic*, **char*** *data*, **int** *size*, **wxIPCFormat** *format*)

Message sent to the server application when the client notifies it to execute the given data. Note that there is no item associated with this message.

wxTCPConnection::OnPoke

virtual bool OnPoke(**const wxString&** *topic*, **const wxString&** *item*, **char*** *data*, **int** *size*, **wxIPCFormat** *format*)

Message sent to the server application when the client notifies it to accept the given

data.

wxTCPConnection::OnRequest

virtual char* OnRequest(**const wxString&** *topic*, **const wxString&** *item*, **int *** *size*, **wxIPCFormat** *format*)

Message sent to the server application when the client calls *wxTCPConnection::Request* (p. 1071). The server should respond by returning a character string from **OnRequest**, or NULL to indicate no data.

wxTCPConnection::OnStartAdvise

virtual bool OnStartAdvise(**const wxString&** *topic*, **const wxString&** *item*)

Message sent to the server application by the client, when the client wishes to start an 'advise loop' for the given topic and item. The server can refuse to participate by returning FALSE.

wxTCPConnection::OnStopAdvise

virtual bool OnStopAdvise(**const wxString&** *topic*, **const wxString&** *item*)

Message sent to the server application by the client, when the client wishes to stop an 'advise loop' for the given topic and item. The server can refuse to stop the advise loop by returning FALSE, although this doesn't have much meaning in practice.

wxTCPConnection::Poke

bool Poke(**const wxString&** *item*, **char*** *data*, **int** *size = -1*, **wxIPCFormat** *format = wxCF_TEXT*)

Called by the client application to poke data into the server. Can be used to transfer arbitrary data to the server. Causes the server connection's *wxTCPConnection::OnPoke* (p. 1070) member to be called. Returns TRUE if successful.

wxTCPConnection::Request

char* Request(**const wxString&** *item*, **int ****size*, **wxIPCFormat** *format = wxIPC_TEXT*)

Called by the client application to request data from the server. Causes the server connection's *wxTCPConnection::OnRequest* (p. 1071) member to be called. Returns a character string (actually a pointer to the connection's buffer) if successful, NULL otherwise.

wxTCPConnection::StartAdvise

bool StartAdvise(**const wxString&** *item*)

Called by the client application to ask if an advise loop can be started with the server. Causes the server connection's *wxTCPConnection::OnStartAdvise* (p. 1071) member to be called. Returns TRUE if the server okays it, FALSE otherwise.

wxTCPConnection::StopAdvise

bool StopAdvise(**const wxString&** *item*)

Called by the client application to ask if an advise loop can be stopped. Causes the server connection's *wxTCPConnection::OnStopAdvise* (p. 1071) member to be called. Returns TRUE if the server okays it, FALSE otherwise.

wxTCPServer

A wxTCPServer object represents the server part of a client-server conversation. It emulates a DDE-style protocol, but uses TCP/IP which is available on most platforms.

A DDE-based implementation for Windows is available using *wxDDEServer* (p. 305).

Derived from

wxServerBase
wxObject (p. 750)

Include files

<wx/sckipc.h>

See also

wxTCPClient (p. 1066), *wxTCPConnection* (p. 1068), *IPC overview* (p. 1438)

wxTCPServer::wxTCPServer

wxTCPServer()

Constructs a server object.

wxTCPServer::Create

bool Create (**const wxString&** *service*)

Registers the server using the given service name. Under Unix, the string must contain an integer id which is used as an Internet port number. FALSE is returned if the call failed (for example, the port number is already in use).

wxTCPServer::OnAcceptConnection

virtual wxConnectionBase * OnAcceptConnection(**const wxString&** *topic*)

When a client calls **MakeConnection**, the server receives the message and this member is called. The application should derive a member to intercept this message and return a connection object of either the standard wxTCPConnection type, or of a user-derived type. If the topic is "STDIO", the application may wish to refuse the connection. Under Unix, when a server is created the OnAcceptConnection message is always sent for standard input and output.

wxTempFile

wxTempFile provides a relatively safe way to replace the contents of the existing file. The name is explained by the fact that it may be also used as just a temporary file if you don't replace the old file contents.

Usually, when a program replaces the contents of some file it first opens it for writing, thus losing all of the old data and then starts recreating it. This approach is not very safe because during the regeneration of the file bad things may happen: the program may find that there is an internal error preventing it from completing file generation, the user may interrupt it (especially if file generation takes long time) and, finally, any other external interrupts (power supply failure or a disk error) will leave you without either the original file or the new one.

wxTempFile addresses this problem by creating a temporary file which is meant to replace the original file - but only after it is fully written. So, if the user interrupts the program during the file generation, the old file won't be lost. Also, if the program discovers itself that it doesn't want to replace the old file there is no problem - in fact, wxTempFile will **not** replace the old file by default, you should explicitly call *Commit* (p. 1075) to do it. Calling *Discard* (p. 1075) explicitly discards any modifications: it closes and deletes the temporary file and leaves the original file unchanged. If you don't call neither of Commit() and Discard(), the destructor will call Discard() automatically.

To summarize: if you want to replace another file, create an instance of wxTempFile passing the name of the file to be replaced to the constructor (you may also use default constructor and pass the file name to *Open* (p. 1074)). Then you can *write* (p. 1074) to

wxTempFile using *wxFile* (p. 398)-like functions and later call Commit() to replace the old file (and close this one) or call Discard() to cancel the modifications.

Derived from

No base class

Include files

<wx/file.h>

See also:

wxFile (p. 398)

wxTempFile::wxTempFile

wxTempFile()

Default constructor - *Open* (p. 1074) must be used to open the file.

wxTempFile::wxTempFile

wxTempFile(**const wxString&** *strName*)

Associates wxTempFile with the file to be replaced and opens it. You should use *IsOpened* (p. 1074) to verify if the constructor succeeded.

wxTempFile::Open

bool Open(**const wxString&** *strName*)

Open the temporary file (strName is the name of file to be replaced), returns TRUE on success, FALSE if an error occurred.

wxTempFile::IsOpened

bool IsOpened() **const**

Returns TRUE if the file was successfully opened.

wxTempFile::Write

bool Write(**const void** **p*, **size_t** *n*)

Write to the file, return TRUE on success, FALSE on failure.

wxTempFile::Write

bool Write(**const wxString&** *str*)

Write to the file, return TRUE on success, FALSE on failure.

wxTempFile::Commit

bool Commit()

Validate changes: deletes the old file of name m_strName and renames the new file to the old name. Returns TRUE if both actions succeeded. If FALSE is returned it may unfortunately mean two quite different things: either that either the old file couldn't be deleted or that the new file couldn't be renamed to the old name.

wxTempFile::Discard

void Discard()

Discard changes: the old file contents is not changed, temporary file is deleted.

wxTempFile::~wxTempFile

~wxTempFile()

Destructor calls *Discard()* (p. 1075) if temporary file is still opened.

wxTextCtrl

A text control allows text to be displayed and edited. It may be single line or multi-line.

Derived from

streambuf
wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/textctrl.h>

Window styles

wxTE_PROCESS_ENTER	The control will generate the message wxEVENT_TYPE_TEXT_ENTER_COMMAND (otherwise pressing <Enter> is either processed internally by the control or used for navigation between dialog controls).
wxTE_PROCESS_TAB	The control will receieve EVT_CHAR messages for TAB pressed - normally, TAB is used for passing to the next control in a dialog instead. For the control created with this style, you can still use Ctrl-Enter to pass to the next control from the keyboard.
wxTE_MULTILINE	The text control allows multiple lines.
wxTE_PASSWORD	The text will be echoed as asterisks.
wxTE_READONLY	The text will not be user-editable.
wxTE_RICH	create rich edit control instead of a normal one under Windows, does nothing elsewhere
wxHSCROLL	A horizontal scrollbar will be created. No effect under GTK+.

See also *window styles overview* (p. 1379) and *wxTextCtrl::wxTextCtrl* (p. 1077).

Remarks

This class multiply-inherits from **streambuf** where compilers allow, allowing code such as the following:

```
wxTextCtrl *control = new wxTextCtrl(...);

ostream stream(control)

stream << 123.456 << " some text\n";
stream.flush();
```

If your compiler does not support derivation from **streambuf** and gives a compile error, define the symbol **NO_TEXT_WINDOW_STREAM** in the wxTextCtrl header file.

Note that any use of C++ iostreams (including this one) deprecated and might get completely removed in the future.

Event handling

The following commands are processed by default event handlers in wxTextCtrl: wxID_CUT, wxID_COPY, wxID_PASTE, wxID_UNDO, wxID_REDO. The associated UI update events are also processed automatically, when the control has the focus.

To process input from a text control, use these event handler macros to direct input to member functions that take a *wxCommandEvent* (p. 153) argument.

EVT_TEXT(id, func)	Respond to a wxEVT_COMMAND_TEXT_UPDATED event, generated when the text changes. Notice that this event will always be sent when the text controls contents changes - whether this is due to user input or comes from the program itself (for example, if SetValue() is called)
EVT_TEXT_ENTER(id, func)	Respond to a wxEVT_COMMAND_TEXT_ENTER event, generated when enter is pressed in a single-line text control.

wxTextCtrl::wxTextCtrl

wxTextCtrl()

Default constructor.

wxTextCtrl(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxString&** *value = ""*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxValidator&** *validator*, **const wxString&** *name = "text"*)

Constructor, creating and showing a text control.

Parameters

parent
     Parent window. Should not be NULL.

id
     Control identifier. A value of -1 denotes a default value.

value
     Default text value.

pos
     Text control position.

size
     Text control size.

style
     Window style. See *wxTextCtrl* (p. 1075).

validator
      Window validator.

name
      Window name.

Remarks

The horizontal scrollbar (**wxTE_HSCROLL** style flag) will only be created for multi-line text controls. Without a horizontal scrollbar, text lines that don't fit in the control's size will be wrapped (but no newline character is inserted). Single line controls don't have a horizontal scrollbar, the text is automatically scrolled so that the *insertion point* (p. 1080) is always visible.

Under Windows, if the **wxTE_RICH** style is used, the window is implemented as a Windows rich text control with (practically) unlimited capacity. Otherwise, normal edit control limits apply (only about 32Kb of total data under Windows 9x).

See also

wxTextCtrl::Create (p. 1080), *wxValidator* (p. 1172)

wxTextCtrl::~wxTextCtrl

~wxTextCtrl()

Destructor, destroying the text control.

wxTextCtrl::AppendText

void AppendText(**const wxString&** *text*)

Appends the text to the end of the text control.

Parameters

text
      Text to write to the text control.

Remarks

After the text is appended, the insertion point will be at the end of the text control. If this behaviour is not desired, the programmer should use *GetInsertionPoint* (p. 1080) and *SetInsertionPoint* (p. 1086).

See also

wxTextCtrl::WriteText (p. 1087)

wxTextCtrl::CanCopy

virtual bool CanCopy()

Returns TRUE if the selection can be copied to the clipboard.

wxTextCtrl::CanCut

virtual bool CanCut()

Returns TRUE if the selection can be cut to the clipboard.

wxTextCtrl::CanPaste

virtual bool CanPaste()

Returns TRUE if the contents of the clipboard can be pasted into the text control. On some platforms (Motif, GTK) this is an approximation and returns TRUE if the control is editable, FALSE otherwise.

wxTextCtrl::CanRedo

virtual bool CanRedo()

Returns TRUE if there is a redo facility available and the last operation can be redone.

wxTextCtrl::CanUndo

virtual bool CanUndo()

Returns TRUE if there is an undo facility available and the last operation can be undone.

wxTextCtrl::Clear

virtual void Clear()

Clears the text in the control.

wxTextCtrl::Copy

virtual void Copy()

Copies the selected text to the clipboard under Motif and MS Windows.

wxTextCtrl::Create

bool Create(**wxWindow**** *parent*, **wxWindowID** *id*, **const wxString&** *value = ""*, **const wxPoint&** *pos*, **const wxSize&** *size = wxDefaultSize*, **long** *style = 0*, **const wxValidator&** *validator*, **const wxString&** *name = "text"*)

Creates the text control for two-step construction. Derived classes should call or replace this function. See *wxTextCtrl::wxTextCtrl* (p. 1077) for further details.

wxTextCtrl::Cut

virtual void Cut()

Copies the selected text to the clipboard and removes the selection.

wxTextCtrl::DiscardEdits

void DiscardEdits()

Resets the internal 'modified' flag as if the current edits had been saved.

wxTextCtrl::GetInsertionPoint

virtual long GetInsertionPoint() **const**

Returns the insertion point. This is defined as the zero based index of the character position to the right of the insertion point. For example, if the insertion point is at the end of the text control, it is equal to both *GetValue()* (p. 1082).Length() and *GetLastPosition()* (p. 1080).

The following code snippet safely returns the character at the insertion point or the zero character if the point is at the end of the control.

```
char GetCurrentChar(wxTextCtrl *tc) {
  if (tc->GetInsertionPoint() == tc->GetLastPosition())
    return '\0';
  return tc->GetValue[tc->GetInsertionPoint()];
}
```

wxTextCtrl::GetLastPosition

virtual long GetLastPosition() **const**

Returns the zero based index of the last position in the text control, which is equal to the number of characters in the control.

wxTextCtrl::GetLineLength

int GetLineLength(long *lineNo*) const

Gets the length of the specified line, not including any trailing newline character(s).

Parameters

lineNo
    Line number (starting from zero).

Return value

The length of the line, or -1 if *lineNo* was invalid.

wxTextCtrl::GetLineText

wxString GetLineText(long *lineNo*) const

Returns the contents of a given line in the text control, not including any trailing newline character(s).

Parameters

lineNo
    The line number, starting from zero.

Return value

The contents of the line.

wxTextCtrl::GetNumberOfLines

int GetNumberOfLines() const

Returns the number of lines in the text control buffer.

Remarks

Note that even empty text controls have one line (where the insertion point is), so GetNumberOfLines() never returns 0.

For gtk_text (multi-line) controls, the number of lines is calculated by actually counting

newline characters in the buffer. You may wish to avoid using functions that work with line numbers if you are working with controls that contain large amounts of text.

wxTextCtrl::GetSelection

virtual void GetSelection(**long*** *from*, **long*** *to*)

Gets the current selection span. If the returned values are equal, there was no selection.

Parameters

from
    The returned first position.

to
    The returned last position.

wxPython note: The wxPython version of this method returns a tuple consisting of the from and to values.

wxTextCtrl::GetValue

wxString GetValue() **const**

Gets the contents of the control. Notice that for a multiline text control, the lines will be separated by (Unix-style) \n characters, even under Windows where they are separated by a \r\n sequence in the native control.

wxTextCtrl::IsModified

bool IsModified() **const**

Returns TRUE if the text has been modified.

wxTextCtrl::LoadFile

bool LoadFile(**const wxString&** *filename*)

Loads and displays the named file, if it exists.

Parameters

filename
    The filename of the file to load.

Return value

TRUE if successful, FALSE otherwise.

wxTextCtrl::OnChar

void OnChar(**wxKeyEvent&** *event*)

Default handler for character input.

Remarks

It is possible to intercept character input by overriding this member. Call this function to let the default behaviour take place; not calling it results in the character being ignored. You can replace the *keyCode* member of *event* to translate keystrokes.

Note that Windows and Motif have different ways of implementing the default behaviour. In Windows, calling wxTextCtrl::OnChar immediately processes the character. In Motif, calling this function simply sets a flag to let default processing happen. This might affect the way in which you write your OnChar function on different platforms.

See also

wxKeyEvent (p. 610)

wxTextCtrl::OnDropFiles

void OnDropFiles(**wxDropFilesEvent&** *event*)

This event handler function implements default drag and drop behaviour, which is to load the first dropped file into the control.

Parameters

event
    The drop files event.

Remarks

This is not implemented on non-Windows platforms.

See also

wxDropFilesEvent (p. 366)

wxTextCtrl::Paste

virtual void Paste()

Pastes text from the clipboard to the text item.

wxTextCtrl::PositionToXY

bool PositionToXY(**long** *pos*, **long ****x*, **long ****y*) **const**

Converts given position to a zero-based column, line number pair.

Parameters

pos
Position.

x
Receives zero based column number.

y
Receives zero based line number.

Return value

TRUE on success, FALSE on failure (most likely due to a too large position parameter).

See also

wxTextCtrl::XYToPosition (p. 1087)

wxPython note: In Python, PositionToXY() returns a tuple containing the x and y values, so (x,y) = PositionToXY() is equivalent to the call described above.

wxTextCtrl::Redo

virtual void Redo()

If there is a redo facility and the last operation can be redone, redoes the last operation. Does nothing if there is no redo facility.

wxTextCtrl::Remove

virtual void Remove(**long** *from*, **long** *to*)

Removes the text starting at the first given position up to (but not including) the character at the last position.

Parameters

from
> The first position.

to
> The last position.

wxTextCtrl::Replace

virtual void Replace(**long** *from*, **long** *to*, **const wxString&** *value*)

Replaces the text starting at the first position up to (but not including) the character at the last position with the given text.

Parameters

from
> The first position.

to
> The last position.

value
> The value to replace the existing text with.

wxTextCtrl::SaveFile

bool SaveFile(**const wxString&** *filename*)

Saves the contents of the control in a text file.

Parameters

filename
> The name of the file in which to save the text.

Return value

TRUE if the operation was successful, FALSE otherwise.

wxTextCtrl::SetEditable

virtual void SetEditable(**const bool** *editable*)

Makes the text item editable or read-only, overriding the **wxTE_READONLY** flag.

Parameters

editable
> If TRUE, the control is editable. If FALSE, the control is read-only.

wxTextCtrl::SetInsertionPoint

virtual void SetInsertionPoint(**long** *pos*)

Sets the insertion point at the given position.

Parameters

pos
> Position to set.

wxTextCtrl::SetInsertionPointEnd

virtual void SetInsertionPointEnd()

Sets the insertion point at the end of the text control. This is equivalent to *SetInsertionPoint* (p. 1086)(*GetLastPosition* (p. 1080)()).

wxTextCtrl::SetSelection

virtual void SetSelection(**long** *from*, **long** *to*)

Selects the text starting at the first position up to (but not including) the character at the last position.

Parameters

from
> The first position.

to
> The last position.

wxTextCtrl::SetValue

virtual void SetValue(**const wxString&** *value*)

Sets the text value and marks the control as not-modified.

Parameters

value
> The new value to set. It may contain newline characters if the text control is multi-

line.

wxTextCtrl::ShowPosition

void ShowPosition(**long** *pos*)

Makes the line containing the given position visible.

Parameters

pos
    The position that should be visible.

wxTextCtrl::Undo

virtual void Undo()

If there is an undo facility and the last operation can be undone, undoes the last operation. Does nothing if there is no undo facility.

wxTextCtrl::WriteText

void WriteText(**const wxString&** *text*)

Writes the text into the text control at the current insertion position.

Parameters

text
    Text to write to the text control.

Remarks

Newlines in the text string are the only control characters allowed, and they will cause appropriate line breaks. See *wxTextCtrl::<<* (p. 1088) and *wxTextCtrl::AppendText* (p. 1078) for more convenient ways of writing to the window.

After the write operation, the insertion point will be at the end of the inserted text, so subsequent write operations will be appended. To append text after the user may have interacted with the control, call *wxTextCtrl::SetInsertionPointEnd* (p. 1086) before writing.

wxTextCtrl::XYToPosition

long XYToPosition(**long** *x*, **long** *y*)

Converts the given zero based column and line number to a position.

Parameters

x

    The column number.

y

    The line number.

Return value

The position value.

wxTextCtrl::operator <<

wxTextCtrl& operator <<(**const wxString&** *s*)

wxTextCtrl& operator <<(**int** *i*)

wxTextCtrl& operator <<(**long** *i*)

wxTextCtrl& operator <<(**float** *f*)

wxTextCtrl& operator <<(**double** *d*)

wxTextCtrl& operator <<(**char** *c*)

Operator definitions for appending to a text control, for example:

```
wxTextCtrl *wnd = new wxTextCtrl(my_frame);

(*wnd) << "Welcome to text control number " << 1 << ".\n";
```

wxTextDataObject

wxTextDataObject is a specialization of wxDataObject for text data. It can be used without change to paste data into the *wxClipboard* (p. 121) or a *wxDropSource* (p. 368). A user may wish to derive a new class from this class for providing text on-demand in order to minimize memory consumption when offering data in several formats, such as plain text and RTF because by default the text is stored in a string in this class, but it might as well be generated when requested. For this, *GetTextLength* (p. 1089) and *GetText* (p. 1089) will have to be overridden.

Note that if you already have the text inside a string, you will not achieve any efficiency gain by overriding these functions because copying wxStrings is already a very efficient operation (data is not actually copied because wxStrings are reference counted).

wxPython note: If you wish to create a derived wxTextDataObject class in wxPython you should derive the class from wxPyTextDataObject in order to get Python-aware capabilities for the various virtual methods.

Virtual functions to override

This class may be used as is, but all of the data transfer functions may be overridden to increase efficiency.

Derived from

wxDataObjectSimple (p. 202)
wxDataObject (p. 197)

Include files

<wx/dataobj.h>

See also

Clipboard and drag and drop overview (p. 1430), *wxDataObject* (p. 197), *wxDataObjectSimple* (p. 202), *wxFileDataObject* (p. 409), *wxBitmapDataObject* (p. 75)

wxTextDataObject::wxTextDataObject

 wxTextDataObject(**const wxString&** *text = wxEmptyString*)

Constructor, may be used to initialise the text (otherwise *SetText* (p. 1090) should be used later).

wxTextDataObject::GetTextLength

virtual size_t GetTextLength() **const**

Returns the data size. By default, returns the size of the text data set in the constructor or using *SetText* (p. 1090). This can be overridden to provide text size data on-demand. It is recommended to return the text length plus 1 for a trailing zero, but this is not strictly required.

wxTextDataObject::GetText

virtual wxString GetText() **const**

Returns the text associated with the data object. You may wish to override this method

when offering data on-demand, but this is not required by wxWindows' internals. Use this method to get data in text form from the *wxClipboard* (p. 121).

wxTextDataObject::SetText

virtual void SetText(**const wxString&** *strText*)

Sets the text associated with the data object. This method is called when the data object receives the data and, by default, copies the text into the member variable. If you want to process the text on the fly you may wish to override this function.

wxTextInputStream

This class provides functions that read text datas using an input stream. So, you can read *text* floats, integers.

The wxTextInputStream correctly reads text files (or streams) in DOS, Macintosh and Unix formats and reports a single newline char as a line ending.

Operator >> is overloaded and you can use this class like a standard C++ iostream. Note, however, that the arguments are the fixed size types wxUint32, wxInt32 etc and on a typical 32-bit computer, none of these match to the "long" type (wxInt32 is defined as int on 32-bit architectures) so that you cannot use long. To avoid problems (here and elsewhere), make use of wxInt32, wxUint32 and similar types.

For example:

```
wxFileInputStream input( "mytext.txt" );
wxTextInputStream text( input );
wxUint8 i1;
float f2;
wxString line;

text >> i1;       // read a 8 bit integer.
text >> i1 >> f2; // read a 8 bit integer followed by float.
text >> line;     // read a text line
```

Include files

<wx/txtstrm.h>

wxTextInputStream::wxTextInputStream

wxTextInputStream(**wxInputStream&** *stream*)

Constructs a text stream object from an input stream. Only read methods will be available.

Parameters

stream
    The input stream.

wxTextInputStream::~wxTextInputStream

~wxTextInputStream()

Destroys the wxTextInputStream object.

wxTextInputStream::Read8

wxUint8 Read8()

Reads a single byte from the stream.

wxTextInputStream::Read16

wxUint16 Read16()

Reads a 16 bit integer from the stream.

wxTextInputStream::Read32

wxUint16 Read32()

Reads a 32 bit integer from the stream.

wxTextInputStream::ReadDouble

double ReadDouble()

Reads a double (IEEE encoded) from the stream.

wxTextInputStream::ReadLine

wxString wxTextInputStream::ReadLine()

Reads a line from the input stream and returns it (without the end of line character).

wxTextInputStream::ReadString

wxString wxTextInputStream::ReadString()

NB: This method is deprecated, use *ReadLine* (p. 1091) or *ReadWord* (p. 1092) instead.

Same as *ReadLine* (p. 1091).

wxTextInputStream::ReadWord

wxString wxTextInputStream::ReadWord()

Reads a word (a sequence of characters until the next separator) from the input stream.

See also

SetStringSeparators (p. 1092)

wxTextInputStream::SetStringSeparators

void SetStringSeparators(**const wxString&** *sep*)

Sets the characters which are used to define the word boundaries in *ReadWord* (p. 1092).

The default separators are the space and TAB characters.

wxTextOutputStream

This class provides functions that write text datas using an output stream. So, you can write *text* floats, integers.

You can also simulate the C++ cout class:

```
wxFFileOutputStream output( stderr );
wxTextOutputStream cout( output );

cout << "This is a text line" << endl;
cout << 1234;
cout << 1.23456;
```

The wxTextOutputStream writes text files (or streams) on DOS, Macintosh and Unix in their native formats (concerning the line ending).

wxTextOutputStream::wxTextOutputStream

wxTextOutputStream(**wxOutputStream&** *stream*, **wxEOL** *mode = wxEOL_NATIVE*)

Constructs a text stream object from an output stream. Only write methods will be available.

Parameters

stream
    The output stream.

mode
    The end-of-line mode. One of **wxEOL_NATIVE**, **wxEOL_DOS**, **wxEOL_MAC** and **wxEOL_UNIX**.

wxTextOutputStream::~wxTextOutputStream

~wxTextOutputStream()

Destroys the wxTextOutputStream object.

wxTextOutputStream::GetMode

wxEOL wxTextOutputStream::GetMode()

Returns the end-of-line mode. One of **wxEOL_DOS**, **wxEOL_MAC** and **wxEOL_UNIX**.

wxTextOutputStream::SetMode

void wxTextOutputStream::SetMode(**wxEOL** *mode = wxEOL_NATIVE*)

Set the end-of-line mode. One of **wxEOL_NATIVE**, **wxEOL_DOS**, **wxEOL_MAC** and **wxEOL_UNIX**.

wxTextOutputStream::Write8

void wxTextOutputStream::Write8(**wxUint8** *i8*)

Writes the single byte *i8* to the stream.

wxTextOutputStream::Write16

void wxTextOutputStream::Write16(**wxUint16** *i16*)

Writes the 16 bit integer *i16* to the stream.

wxTextOutputStream::Write32

void wxTextOutputStream::Write32(**wxUint32** *i32*)

Writes the 32 bit integer *i32* to the stream.

wxTextOutputStream::WriteDouble

virtual void wxTextOutputStream::WriteDouble(**double** *f*)

Writes the double *f* to the stream using the IEEE format.

wxTextOutputStream::WriteString

virtual void wxTextOutputStream::WriteString(**const wxString&** *string*)

Writes *string* as a line. Depending on the end-of-line mode, it adds \n, \r or \r\n.

wxTextEntryDialog

This class represents a dialog that requests a one-line text string from the user. It is implemented as a generic wxWindows dialog.

Derived from

wxDialog (p. 312)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/textdlg.h>

See also

wxTextEntryDialog::wxTextEntryDialog

 wxTextEntryDialog(**wxWindow*** *parent*, **const wxString&** *message*, **const wxString&** *caption* = *"Please enter text"*, **const wxString&** *defaultValue* = *""*, **long** *style* = *wxOK | wxCANCEL | wxCENTRE,* **const wxPoint&** *pos* = *wxDefaultPosition*)

Constructor. Use *wxTextEntryDialog::ShowModal* (p. 1096) to show the dialog.

Parameters

parent
    Parent window.

message
    Message to show on the dialog.

defaultValue
    The default value, which may be the empty string.

style
    A dialog style, specifying the buttons (wxOK, wxCANCEL) and an optional wxCENTRE style. Additionally, wxTextCtrl styles (such as `wxTE_PASSWORD` may be specified here.

pos
    Dialog position.

wxTextEntryDialog::~wxTextEntryDialog

 ~wxTextEntryDialog()

Destructor.

wxTextEntryDialog::GetValue

wxString GetValue() **const**

Returns the text that the user has entered if the user has pressed OK, or the original value if the user has pressed Cancel.

wxTextEntryDialog::SetValue

void SetValue(**const wxString&** *value*)

Sets the default text value.

wxTextEntryDialog::ShowModal

int ShowModal()

Shows the dialog, returning wxID_OK if the user pressed OK, and wxOK_CANCEL otherwise.

wxTextDropTarget

A predefined drop target for dealing with text data.

Derived from

wxDropTarget (p. 370)

Include files

<wx/dnd.h>

See also

Drag and drop overview (p. 1430), *wxDropSource* (p. 368), *wxDropTarget* (p. 370), *wxFileDropTarget* (p. 414)

wxTextDropTarget::wxTextDropTarget

wxTextDropTarget()

Constructor.

wxTextDropTarget::OnDrop

virtual bool OnDrop(**long** *x*, **long** *y*, **const void** **data*, **size_t** *size*)

See *wxDropTarget::OnDrop* (p. 372). This function is implemented appropriately for text, and calls *wxTextDropTarget::OnDropText* (p. 1096).

wxTextDropTarget::OnDropText

virtual bool OnDropText(**long** *x*, **long** *y*, **const char** **data*)

Override this function to receive dropped text.

Parameters

x
> The x coordinate of the mouse.

y
> The y coordinate of the mouse.

data
> The data being dropped: a NULL-terminated string.

Return value

Return TRUE to accept the data, FALSE to veto the operation.

wxTimeSpan

TODO

wxTextValidator

wxTextValidator validates text controls, providing a variety of filtering behaviours.

For more information, please see *Validator overview* (p. 1382).

Derived from

wxValidator (p. 1172)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/valtext.h>

See also

Validator overview (p. 1382), *wxValidator* (p. 1172), *wxGenericValidator* (p. 479)

wxTextValidator::wxTextValidator

wxTextValidator(**const wxTextValidator&** *validator*)

Copy constructor.

wxTextValidator(**long** *style = wxFILTER_NONE*, **wxString*** *valPtr = NULL*)

Constructor, taking a style and optional pointer to a wxString variable.

Parameters

style
> A bitlist of flags, which can be:

wxFILTER_NONE	No filtering takes place.
wxFILTER_ASCII	Non-ASCII characters are filtered out.
wxFILTER_ALPHA	Non-alpha characters are filtered out.
wxFILTER_ALPHANUMERIC	Non-alphanumeric characters are filtered out.
wxFILTER_NUMERIC	Non-numeric characters are filtered out.
wxFILTER_INCLUDE_LIST	Use an include list. The validator checks if the user input is on the list, complaining if not.
wxFILTER_EXCLUDE_LIST	Use an exclude list. The validator checks if the user input is on the list, complaining if it is.

valPtr
> A pointer to a wxString variable that contains the value. This variable should have a lifetime equal to or longer than the validator lifetime (which is usually determined by the lifetime of the window). If NULL, the validator uses its own internal storage for the value.

wxTextValidator::~wxTextValidator

~wxTextValidator()

Destructor.

wxTextValidator::Clone

virtual wxValidator* Clone() **const**

Clones the text validator using the copy constructor.

wxTextValidator::GetExcludeList

wxStringList& GetExcludeList() const

Returns a reference to the exclude list (the list of invalid values).

wxTextValidator::GetIncludeList

wxStringList& GetIncludeList() const

Returns a reference to the include list (the list of valid values).

wxTextValidator::GetStyle

long GetStyle() const

Returns the validator style.

wxTextValidator::OnChar

void OnChar(wxKeyEvent& *event*)

Receives character input from the window and filters it according to the current validator style.

wxTextValidator::SetExcludeList

void SetExcludeList(const wxStringList& *stringList*)

Sets the exclude list (invalid values for the user input).

wxTextValidator::SetIncludeList

void SetIncludeList(const wxStringList& *stringList*)

Sets the include list (valid values for the user input).

wxTextValidator::SetStyle

void SetStyle(long *style*)

Sets the validator style.

wxTextValidator::TransferFromWindow

virtual bool TransferFromWindow()

Transfers the string value to the window.

wxTextValidator::TransferToWindow

virtual bool TransferToWindow()

Transfers the window value to the string.

wxTextValidator::Validate

virtual bool Validate(**wxWindow*** *parent*)

Validates the window contents against the include or exclude lists, depending on the validator style.

wxTextFile

The wxTextFile is a simple class which allows to work with text files on line by line basis. It also understands the differences in line termination characters under different platforms and will not do anything bad to files with "non native" line termination sequences - in fact, it can be also used to modify the text files and change the line termination characters from one type (say DOS) to another (say Unix).

One word of warning: the class is not at all optimized for big files and so it will load the file entirely into memory when opened. Of course, you should not work in this way with large files (as an estimation, anything over 1 Megabyte is surely too big for this class). On the other hand, it is not a serious limitation for the small files like configuration files or programs sources which are well handled by wxTextFile.

The typical things you may do with wxTextFile in order are:

- Create and open it: this is done with either *Create* (p. 1102) or *Open* (p. 1105) function which opens the file (name may be specified either as the argument to these functions or in the constructor), reads its contents in memory (in the case of `Open()`) and closes it.
- Work with the lines in the file: this may be done either with "direct acces s" functions like *GetLineCount* (p. 1103) and *GetLine* (p. 1103) (*operator[]* does

exactly the same but looks more like array addressing) or with "sequential access" functions which include *GetFirstLine* (p. 1104)/*GetNextLine* (p. 1104) and also *GetLastLine* (p. 1104)/*GetPrevLine* (p. 1104). For the sequential access functions the current line number is maintained: it is returned by *GetCurrentLine* (p. 1103) and may be changed with *GoToLine* (p. 1103).

• Add/remove lines to the file: *AddLine* (p. 1102) and *InsertLine* (p. 1105) add new lines while *RemoveLine* (p. 1106) deletes the existing ones.

• Save your changes: notice that the changes you make to the file will **not** be saved automatically; calling *Close* (p. 1102) or doing nothing discards them! To save the changes you must explicitly call *Write* (p. 1106) - here, you may also change the line termination type if you wish.

Derived from

No base class

Include files

<wx/textfile.h>

Data structures

The following constants identify the line termination type:

```
enum wxTextFileType
{
    wxTextFileType_None,  // incomplete (the last line of the file
only)
    wxTextFileType_Unix,  // line is terminated with 'LF' = 0xA = 10 =
'\n'
    wxTextFileType_Dos,   //                          'CR' 'LF'
    wxTextFileType_Mac    //                          'CR' = 0xD = 13 =
'\r'
};
```

See also

wxFile (p. 398)

wxTextFile::wxTextFile

wxTextFile() **const**

Default constructor, use *Create* (p. 1102) or *Open* (p. 1105) with a file name parameter to initialize the object.

wxTextFile::wxTextFile

wxTextFile (**const wxString&** *strFile*) **const**

Constructor does not load the file into memory, use Open() to do it.

wxTextFile::~wxTextFile

~wxTextFile() **const**

Destructor does nothing.

wxTextFile::AddLine

void AddLine(**const wxString&** *str*, **wxTextFileType** *type* = *typeDefault*) **const**

Adds a line to the end of file.

wxTextFile::Close

bool Close() **const**

Closes the file and frees memory, **losing all changes**. Use *Write()* (p. 1106) if you want to save them.

wxTextFile::Create

bool Create() **const**

bool Create(**const wxString&** *strFile*) **const**

Creates the file with the given name or the name which was given in the*constructor* (p. 1101). The array of file lines is initially empty.

It will fail if the file already exists, *Open* (p. 1105) should be used in this case.

wxTextFile::Exists

bool Exists() **const**

Return TRUE if file exists - the name of the file should have been specified in the constructor before calling Exists().

wxTextFile::IsOpened

bool IsOpened() **const**

Returns TRUE if the file is currently opened.

wxTextFile::GetLineCount

size_t GetLineCount() **const**

Get the number of lines in the file.

wxTextFile::GetLine

wxString& GetLine(**size_t** *n*) **const**

Retrieves the line number *n* from the file. The returned line may be modified but you shouldn't add line terminator at the end - this will be done by wxTextFile.

wxTextFile::operator[]

wxString& operator[](**size_t** *n*) **const**

The same as *GetLine* (p. 1103).

wxTextFile::GetCurrentLine

size_t GetCurrentLine() **const**

Returns the current line: it has meaning only when you're using GetFirstLine()/GetNextLine() functions, it doesn't get updated when you're using "direct access" functions like GetLine(). GetFirstLine() and GetLastLine() also change the value of the current line, as well as GoToLine().

wxTextFile::GoToLine

void GoToLine(**size_t** *n*) **const**

Changes the value returned by *GetCurrentLine* (p. 1103) and used by *GetFirstLine()* (p. 1104)/*GetNextLine()* (p. 1104).

wxTextFile::Eof

bool Eof() **const**

Returns TRUE if the current line is the last one.

wxTextFile::GetEOL

static const char* GetEOL(**wxTextFileType** *type* = *typeDefault*) **const**

Get the line termination string corresponding to given constant. *typeDefault* is the value defined during the compilation and corresponds to the native format of the platform, i.e. it will be wxTextFileType_Dos under Windows, wxTextFileType_Unix under Unix and wxTextFileType_Mac under Mac.

wxTextFile::GetFirstLine

wxString& GetFirstLine() **const**

This method together with *GetNextLine()* (p. 1104) allows more "iterator-like" traversal of the list of lines, i.e. you may write something like:

```
wxTextFile file;
...
for ( str = file.GetFirstLine(); !file.Eof(); str = file.GetNextLine()
)
{
    // do something with the current line in str
}
// do something with the last line in str
```

wxTextFile::GetNextLine

wxString& GetNextLine()

Gets the next line (see *GetFirstLine* (p. 1104) for the example).

wxTextFile::GetPrevLine

wxString& GetPrevLine()

Gets the previous line in the file.

wxTextFile::GetLastLine

wxString& GetLastLine()

Gets the last line of the file. Together with *GetPrevLine* (p. 1104) it allows to enumerate the lines in the file from the end to the beginning like this:

```
wxTextFile file;
...
for ( str = file.GetLastLine();
      file.GetCurrentLine() > 0;
      str = file.GetPrevLine() )
{
    // do something with the current line in str
}
// do something with the first line in str
```

wxTextFile::GetLineType

wxTextFileType GetLineType(size_t *n*) const

Get the type of the line (see also *GetEOL* (p. 1104))

wxTextFile::GuessType

wxTextFileType GuessType() const

Guess the type of file (which is supposed to be opened). If sufficiently many lines of the file are in DOS/Unix/Mac format, the corresponding value will be returned. If the detection mechanism fails wxTextFileType_None is returned.

wxTextFile::GetName

const char* GetName() const

Get the name of the file.

wxTextFile::InsertLine

void InsertLine(const wxString& *str*, size_t *n*, wxTextFileType *type = typeDefault*) const

Insert a line before the line number *n*.

wxTextFile::Open

bool Open() const

bool Open(const wxString& *strFile*) const

Open() opens the file with the given name or the name which was given in the*constructor* (p. 1101) and also loads file in memory on success. It will fail if the file

does not exist, *Create* (p. 1102) should be used in this case.

wxTextFile::RemoveLine

void RemoveLine(**size_t** *n*) **const**

Delete line number *n* from the file.

wxTextFile::Write

bool Write(**wxTextFileType** *typeNew = wxTextFileType_None*) **const**

Change the file on disk. The *typeNew* parameter allows you to change the file format (default argument means "don't change type") and may be used to convert, for example, DOS files to Unix.

Returns TRUE if operation succeeded, FALSE if it failed.

wxThread

A thread is basically a path of execution through a program. Threads are also sometimes called *light-weight processes*, but the fundamental difference between threads and processes is that memory spaces of different processes are separated while all threads share the same address space. While it makes it much easier to share common data between several threads, it also makes much easier to shoot oneself in the foot, so careful use of synchronization objects such as *mutexes* (p. 735) and/or *critical sections* (p. 179) is recommended.

There are two types of threads in wxWindows: *detached* and *joinable* ones, just as in POSIX thread API (but unlike Win32 threads where all threads are joinable). The difference between the two is that only joinbale threads can return a return code - it is returned by Wait() function. The detached threads (default) can not be waited for.

You shouldn't hurry to create all the threads joinable, however, because this has a disadvantage as well: you **must** Wait() for a joinable thread of the system resources used by it will never be freed and you also must delete the corresponding wxThread object yourself, while detached threads are of the "fire-and-forget" kind: you only have to start a detached thread and it will terminate and destroy itself.

This means, of course, that all detached threads **must** be created on the heap because the thread will call `delete this;` upon termination. The joinable threads may be created on stack (don't create global thread objects because they allocate memory in their constructor which is a badthing to do), although usually they will be created on the heap as well.

Derived from

None.

Include files

<wx/thread.h>

See also

wxMutex (p. 735), *wxCondition* (p. 161), *wxCriticalSection* (p. 179)

wxThread::wxThread

wxThread(**wxThreadKind** *kind* = *wxTHREAD_DETACHED*)

Constructor creates a new detached (default) or joinable C++ thread object. It does not create (or starts execution of) the real thread - for this you should use *Create* (p. 1107) and *Run* (p. 1111) methods.

The possible values for *kind* parameters are:

wxTHREAD_DETACHED	Create a detached thread.
wxTHREAD_JOINABLE	Create a joinable thread

wxThread::~wxThread

~wxThread()

Destructor frees the ressources associated with the thread. Notice that you should never delete a detached thread - you may only call *Delete* (p. 1108) on it or wait until it terminates (and auto destructs) itself. Because the detached threads delete themselves, they can only be allocated on the heap.

The joinable threads, however, may and should be deleted explicitly and *Delete* (p. 1108) and *Kill* (p. 1110) functions will not delete the C++ thread object. It is also safe to allocate them on stack.

wxThread::Create

wxThreadError Create()

Creates a new thread. The thread object is created in the suspended state, you should call *Run* (p. 1111) to start running it.

Return value

One of:

wxTHREAD_NO_ERROR	There was no error.
wxTHREAD_NO_RESOURCE	There were insufficient resources to create a new thread.
wxTHREAD_RUNNING	The thread is already running.

wxThread::Delete

void Delete()

Calling *Delete* (p. 1108) is a graceful way to terminate the thread. It asks the thread to terminate and, if the thread code is well written, the thread will terminate after the next call to *TestDestroy* (p. 1112) which should happen quiet soon.

However, if the thread doesn't call *TestDestroy* (p. 1112) often enough (or at all), the function will not return immediately, but wait until the thread terminates. As it may take a long time, the message processing is not stopped during this function execution, so the message handlers may be called from inside it!

Delete() may be called for thread in any state: running, paused or even not yet created. Moreover, it must be called if *Create* (p. 1107) or *Run* (p. 1111) failed for a detached thread to free the memory occupied by the thread object (it will be done in the destructor for joinable threads).

Delete() may be called for thread in any state: running, paused or even not yet created. Moreover, it must be called if *Create* (p. 1107) or *Run* (p. 1111) fail to free the memory occupied by the thread object. However, you should not call Delete() on a detached thread which already terminated - doing so will probably result in a crash because the thread object doesn't exist any more.

For detached threads Delete() will also delete the C++ thread object, but it will not do this for joinable ones.

This function can only be called from another thread context.

wxThread::Entry

virtual ExitCode Entry()

This is the entry point of the thread. This function is pure virtual and must be implemented by any derived class. The thread execution will start here.

The returned value is the thread exit code which is only useful for the joinable threads and is the value returned by *Wait* (p. 1113).

This function is called by wxWindows itself and should never be called directly.

wxThread::Exit

void Exit(**ExitCode** *exitcode = 0*)

This is a protected function of wxThread class and thus can be called only from a derived class. It also can be called only in the context of this thread, i.e. a thread can only exit from itself, not from another thread.

This function will terminate the OS thread (i.e. stop the associated path of execution) and also delete the associated C++ object for detached threads. *wxThread::OnExit* (p. 1111) will be called just before exiting.

wxThread::GetCPUCount

static int GetCPUCount()

Returns the number of system CPUs or -1 if the value is unknown.

See also

SetConcurrency (p. 1112)

wxThread::GetId

unsigned long GetId() **const**

Gets the thread identifier: this is a platform dependent number which uniquely identifies the thread throughout the system during its existence (i.e. the thread identifiers may be reused).

wxThread::GetPriority

int GetPriority() **const**

Gets the priority of the thread, between zero and 100.

The following priorities are defined:

WXTHREAD_MIN_PRIORITY   0
WXTHREAD_DEFAULT_PRIORITY 50
WXTHREAD_MAX_PRIORITY   100

wxThread::IsAlive

bool IsAlive() const

Returns TRUE if the thread is alive (i.e. started and not terminating).

wxThread::IsDetached

bool IsDetached() const

Returns TRUE if the thread is of detached kind, FALSE if it is a joinable one.

wxThread::IsMain

static bool IsMain()

Returns TRUE if the calling thread is the main application thread.

wxThread::IsPaused

bool IsPaused() const

Returns TRUE if the thread is paused.

wxThread::IsRunning

bool IsRunning() const

Returns TRUE if the thread is running.

wxThread::Kill

wxThreadError Kill()

Immediately terminates the target thread. **This function is dangerous and should be used with extreme care (and not used at all whenever possible)!** The resources allocated to the thread will not be freed and the state of the C runtime library may become inconsistent. Use *Delete()* (p. 1108) instead.

For detached threads Kill() will also delete the associated C++ object, however this will not happen for joinable threads and this means that you will still have to delete the wxThread object yourself to avoid memory leaks. In neither case *OnExit* (p. 1111) of the dying thread will be called, so no thread-specific cleanup will be performed.

This function can only be called from another thread context, i.e. a thread can not kill itself.

It is also an error to call this function for a thread which is not running or paused (in the latter case, the thread will be resumed first) - if you do it, `wxTHREAD_NOT_RUNNING` error will be returned.

wxThread::OnExit

void OnExit()

Called when the thread exits. This function is called in the context of the thread associated with the wxThread object, not in the context of the main thread. This function will not be called if the thread was *killed* (p. 1110).

This function should never be called directly.

wxThread::Pause

wxThreadError Pause()

Suspends the thread. Under some implementations (Win32), the thread is suspended immediately, under others it will only be suspended when it calls *TestDestroy* (p. 1112) for the next time (hence, if the thread doesn't call it at all, it won't be suspended).

This function can only be called from another thread context.

wxThread::Run

wxThreadError Run()

Starts the thread execution. Should be called after *Create* (p. 1107).

This function can only be called from another thread context.

wxThread::SetPriority

void SetPriority(int *priority*)

Sets the priority of the thread, between zero and 100. This must be set before the thread is created.

The following priorities are already defined:

WXTHREAD_MIN_PRIORITY   0

WXTHREAD_DEFAULT_PRIORITY   50
WXTHREAD_MAX_PRIORITY   100

wxThread::Sleep

static void Sleep(**unsigned long** *milliseconds*)

Pauses the thread execution for the given amount of time.

This function should be used instead of *wxSleep* (p. 1288) by all worker (i.e. all except the main one) threads.

wxThread::Resume

wxThreadError Resume()

Resumes a thread suspended by the call to *Pause* (p. 1111).

This function can only be called from another thread context.

wxThread::SetConcurrency

static bool SetConcurrency(**size_t** *level*)

Sets the thread concurrency level for this process. This is, roughly, the number of threads that the system tries to schedule to run in parallel. The value of 0 for *level* may be used to set the default one.

Returns TRUE on success or FALSE otherwise (for example, if this function is not implemented for this platform (currently everything except Solaris)).

wxThread::TestDestroy

bool TestDestroy()

This function should be periodically called by the thread to ensure that calls to *Pause* (p. 1111) and *Delete* (p. 1108) will work. If it returns TRUE, the thread should exit as soon as possible.

wxThread::This

static wxThread * This()

Return the thread object for the calling thread. NULL is returned if the calling thread is

the main (GUI) thread, but *IsMain* (p. 1110) should be used to test whether the thread is really the main one because NULL may also be returned for the thread not created with wxThread class. Generally speaking, the return value for such thread is undefined.

wxThread::Yield

void Yield()

Give the rest of the thread time slice to the system allowing the other threads to run. See also *Sleep()* (p. 1112).

wxThread::Wait

ExitCode Wait() const

Waits until the thread terminates and returns its exit code or `(ExitCode)-1` on error.

You can only Wait() for joinable (not detached) threads.

This function can only be called from another thread context.

wxTime

Representation of time and date.

NOTE: this class is retained only for compatibility, and has been replaced by *wxDateTime* (p. 215). wxTime may be withdrawn in future versions of wxWindows.

Derived from

wxObject (p. 750)

Include files

<wx/time.h>

Data structures

```
typedef unsigned short hourTy;
typedef unsigned short minuteTy;
typedef unsigned short secondTy;
typedef unsigned long clockTy;
enum tFormat { wx12h, wx24h };
enum tPrecision { wxStdMinSec, wxStdMin };
```

See also

wxDate (p. 207)

wxTime::wxTime

wxTime ()

Initialize the object using the current time.

wxTime (**clockTy** *s*)

Initialize the object using the number of seconds that have elapsed since ???.

wxTime (**const wxTime&** *time*)

Copy constructor.

wxTime (**hourTy** *h*, **minuteTy** *m*, **secondTy** *s = 0*, **bool** *dst = FALSE*)

Initialize using hours, minutes, seconds, and whether DST time.

wxTime (**const wxDate&** *date*, **hourTy** *h = 0*, **minuteTy** *m = 0*, **secondTy** *s = 0*, **bool** *dst = FALSE*)

Initialize using a *wxDate* (p. 207) object, hours, minutes, seconds, and whether DST time.

wxTime::GetDay

int GetDay() **const**

Returns the day of the month.

wxTime::GetDayOfWeek

int GetDayOfWeek() **const**

Returns the day of the week, a number from 0 to 6 where 0 is Sunday and 6 is Saturday.

wxTime::GetHour

hourTy GetHour() **const**

Returns the hour in local time.

wxTime::GetHourGMT

hourTy GetHourGMT() **const**

Returns the hour in GMT.

wxTime::GetMinute

minuteTy GetMinute() **const**

Returns the minute in local time.

wxTime::GetMinuteGMT

minuteTy GetMinuteGMT() **const**

Returns the minute in GMT.

wxTime::GetMonth

int GetMonth() **const**

Returns the month.

wxTime::GetSecond

secondTy GetSecond() **const**

Returns the second in local time or GMT.

wxTime::GetSecondGMT

secondTy GetSecondGMT() **const**

Returns the second in GMT.

wxTime::GetSeconds

clockTy GetSeconds() **const**

Returns the number of seconds since ???.

wxTime::GetYear

int GetYear() **const**

Returns the year.

wxTime::FormatTime

char* FormatTime() **const**

Formats the time according to the current formatting options: see *wxTime::SetFormat* (p. 1116).

wxTime::IsBetween

bool IsBetween(**const wxTime&** *a*, **const wxTime&** *b*) **const**

Returns TRUE if this time is between the two given times.

wxTime::Max

wxTime Max(**const wxTime&** *time*) **const**

Returns the maximum of the two times.

wxTime::Min

wxTime Min(**const wxTime&** *time*) **const**

Returns the minimum of the two times.

wxTime::SetFormat

static void SetFormat(**const tFormat** *format = wx12h*, **const tPrecision** *precision = wxStdMinSec*)

Sets the format and precision.

wxTime::operator char*

operator char*()

Returns a pointer to a static char* containing the formatted time.

wxTime::operator wxDate

operator wxDate() **const**

Converts the wxTime into a wxDate.

wxTime::operator =

void operator =(**const wxTime&** *t*)

Assignment operator.

wxTime::operator <

bool operator <(**const wxTime&** *t*) **const**

Less than operator.

wxTime::operator <=

bool operator <=(**const wxTime&** *t*) **const**

Less than or equal to operator.

wxTime::operator >

bool operator >(**const wxTime&** *t*) **const**

Greater than operator.

wxTime::operator >=

bool operator >=(**const wxTime&** *t*) **const**

Greater than or equal to operator.

wxTime::operator ==

bool operator ==(**const wxTime&** *t*) **const**

Equality operator.

wxTime::operator !=

bool operator !=(**const wxTime&** *t*) **const**

Inequality operator.

wxTime::operator +

bool operator +(**long** *sec*) **const**

Addition operator.

wxTime::operator -

bool operator -(**long** *sec*) **const**

Subtraction operator.

wxTime::operator +=

bool operator +=(**long** *sec*) **const**

Increment operator.

wxTime::operator -=

bool operator -=(**long** *sec*) **const**

Decrement operator.

wxTimer

The wxTimer class allows you to execute code at specified intervals. Its precision is platform-dependent, but in general will not be better than 1ms nor worse than 1s.

There are two different ways to use this class:

1. You may derive a new class from wxTimer and override the *Notify* (p. 1120) member to perform the required action.
2. Or you may redirect the notifications to any *wxEvtHandler* (p. 380) derived object by using the non default constructor or *SetOwner* (p. 1120). Then use EVT_TIMER macro to connect it to the event handler which will receive *wxTimerEvent* (p. 1121) notifications.

In any case, you must start the timer with *Start* (p. 1120) after constructing it before it actually starts sending notifications. It can be stopped later with *Stop* (p. 1120).

Derived from

wxObject (p. 750)

Include files

<wx/timer.h>

See also

::wxStartTimer (p. 1308), *::wxGetElapsedTime* (p. 1307), *wxStopWatch* (p. 1002)

wxTimer::wxTimer

wxTimer()

Default constructor. If you use it to construct the object and don't call *SetOwner* (p. 1120) later, you must override *Notify* (p. 1120) method to process the notifications.

wxTimer(**wxEvtHandler** * *owner*, **int** *id = -1*)

Creates a timer and associates it with *owner*. Please see *SetOwner* (p. 1120) for the description of parameters.

wxTimer::~wxTimer

~wxTimer()

Destructor. Stops the timer if it is running.

wxTimer::GetInterval

wxtimergetinterval

int GetInterval() **const**

Returns the current interval for the timer (in milliseconds).

wxTimer::IsOneShot

bool IsOneShot() **const**

Returns TRUE if the timer is one shot, i.e. if it will stop after firing the first notification automatically.

wxTimer::IsRunning

bool IsRunning() **const**

Returns TRUE if the timer is running, FALSE if it is stopped.

wxTimer::Notify

void Notify()

This member should be overridden by the user if the default constructor was used and *SetOwner* (p. 1120) wasn't called.

Perform whatever action which is to be taken periodically here.

wxTimer::SetOwner

void SetOwner(**wxEvtHandler *** *owner*, **int** *id = -1*)

Associates the timer with the given *owner* object. When the timer is running, the owner will receive *timer events* (p. 1121) with id equal to *id* specified here.

wxTimer::Start

bool Start(**int** *milliseconds = -1*, **bool** *oneShot=FALSE*)

(Re)starts the timer. If *milliseconds* parameter is -1 (value by default), the previous value is used. Returns FALSE if the timer could not be started, TRUE otherwise (in MS Windows timers are a limited resource).

If *oneShot* is FALSE (the default), the *Notify* (p. 1120) function will be called repeatedly until the timer is stopped. If TRUE, it will be called only once and the timer will stop automatically.

wxTimer::Stop

void Stop()

Stops the timer.

wxTimerEvent

wxTimerEvent object is passed to the event handler of timer events.

For example:

```
class MyFrame : public wxFrame
{
public:
    ...
    void OnTimer(wxTimerEvent& event);

private:
    wxTimer m_timer;
};

BEGIN_EVENT_TABLE(MyFrame, wxFrame)
    EVT_TIMER(TIMER_ID, MyFrame::OnTimer)
END_EVENT_TABLE()

MyFrame::MyFrame()
        : m_timer(this, TIMER_ID)
{
    m_timer.Start(1000);    // 1 second interval
}

void MyFrame::OnTimer(wxTimerEvent& event)
{
    // do whatever you want to do every second here
}
```

Include files

<wx/timer.h>

See also

wxTimer (p. 1118)

wxTimerEvent::GetInterval

int GetInterval() **const**

Returns the interval of the timer which generated this event.

wxTipProvider

This is the class used together with *wxShowTip* (p. 1268) function. It must implement *GetTip* (p. 1122) function and return the current tip from it (different tip each time it is called).

You will never use this class yourself, but you need it to show startup tips with wxShowTip. Also, if you want to get the tips text from elsewhere than a simple text file, you will want to derive a new class from wxTipProvider and use it instead of the one returned by *wxCreateFileTipProvider* (p. 1262).

Derived from

None.

Include files

<wx/tipdlg.h>

See also

Startup tips overview (p. 1428), *::wxShowTip* (p. 1268)

wxTipProvider::wxTipProvider

wxTipProvider(**size_t** *currentTip*)

Constructor.

currentTip
    The starting tip index.

wxTipProvider::GetTip

wxString GetTip()

Return the text of the current tip and pass to the next one. This function is pure virtual, it should be implemented in the derived classes.

wxCurrentTipProvider::GetCurrentTip

size_t GetCurrentTip() **const**

Returns the index of the current tip (i.e. the one which would be returned by GetTip).

The program usually remembers the value returned by this function after calling *wxShowTip* (p. 1268). Note that it is not the same as the value which was passed to wxShowTip + 1 because the user might have pressed the "Next" button in the tip dialog.

wxToolBar

The name wxToolBar is defined to be a synonym for one of the following classes:

- **wxToolBar95** The native Windows 95 toolbar. Used on Windows 95, NT 4 and above.
- **wxToolBarMSW** A Windows implementation. Used on 16-bit Windows.
- **wxToolBarGTK** The GTK toolbar.
- **wxToolBarSimple** A simple implementation, with scrolling. Used on platforms with no native toolbar control, or where scrolling is required.

Note that the base class **wxToolBarBase** defines automatic scrolling management functionality which is similar to *wxScrolledWindow* (p. 916), so please refer to this class also. Not all toolbars support scrolling, but wxToolBarSimple does.

Derived from

wxToolBarBase
wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/toolbar.h> (to allow wxWindows to select an appropriate toolbar class)
<wx/tbarbase.h> (the base class)
<wx/tbarmsw.h> (the non-Windows 95 Windows toolbar class)
<wx/tbar95.h> (the Windows 95/98 toolbar class)
<wx/tbarsmpl.h> (the generic simple toolbar class)

Remarks

You may also create a toolbar that is managed by the frame, by calling *wxFrame::CreateToolBar* (p. 458).

Due to the use of native toolbars on the various platforms, certain adaptions will often have to be made in order to get optimal look on all platforms as some platforms ignore the values for explicit placement and use their own layout and the meaning of a "separator" is a vertical line under Windows95 vs. simple space under GTK etc.

wxToolBar95: Note that this toolbar paints tools to reflect user-selected colours. The toolbar orientation must always be **wxHORIZONTAL** .

wxToolBarGtk: The toolbar orientation is ignored and is always **wxHORIZONTAL** .

Window styles

wxTB_FLAT	Gives the toolbar a flat look ('coolbar' or 'flatbar' style). Windows 95 and GTK 1.2 only.
wxTB_DOCKABLE	Makes the toolbar floatable and dockable. GTK only.
wxTB_HORIZONTAL	Specifies horizontal layout.
wxTB_VERTICAL	Specifies vertical layout (not available for the GTK and Windows 95 toolbar).
wxTB_3DBUTTONS	Gives wxToolBarSimple a mild 3D look to its buttons.

See also *window styles overview* (p. 1379).

Event handling

The toolbar class emits menu commands in the same was that a frame menubar does, so you can use one EVT_MENU macro for both a menu item and a toolbar button. The event handler functions take a wxCommandEvent argument. For most event macros, the identifier of the tool is passed, but for EVT_TOOL_ENTER the toolbar window is passed and the tool id is retrieved from the wxCommandEvent. This is because the id may be -1 when the mouse moves off a tool, and -1 is not allowed as an identifier in the event system.

Note that tool commands (and UI update events for tools) are first sent to the focus window within the frame that contains the toolbar. If no window within the frame has the focus, then the events are sent directly to the toolbar (and up the hierarchy to the frame, depending on where the application has put its event handlers). This allows command and UI update handling to be processed by specific windows and controls, and not necessarily by the application frame.

EVT_TOOL(id, func)	Process a wxEVT_COMMAND_TOOL_CLICKED event (a synonym for wxEVT_COMMAND_MENU_SELECTED). Pass the id of the tool.
EVT_MENU(id, func)	The same as EVT_TOOL.
EVT_TOOL_RANGE(id1, id2, func)	Process a wxEVT_COMMAND_TOOL_CLICKED event for a range id identifiers. Pass the ids of the tools.

EVT_MENU_RANGE(id1, id2, func)   The same as EVT_TOOL_RANGE.

EVT_TOOL_RCLICKED(id, func)   Process a
                                     wxEVT_COMMAND_TOOL_RCLICKED event.
                                     Pass the id of the tool.

EVT_TOOL_RCLICKED_RANGE(id1, id2, func)   Process a
                                     wxEVT_COMMAND_TOOL_RCLICKED event
                                     for a range of ids. Pass the ids of the tools.

EVT_TOOL_ENTER(id, func)   Process a wxEVT_COMMAND_TOOL_ENTER
                                     event. Pass the id of the toolbar itself. The
                                     value of wxCommandEvent::GetSelection is
                                     the tool id, or -1 if the mouse cursor has moved
                                     off a tool.

See also

Toolbar overview (p. 1421), *wxScrolledWindow* (p. 916)

wxToolBar::wxToolBar

wxToolBar()

Default constructor.

wxToolBar(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* =
wxDefaultPosition, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* =
wxTB_HORIZONTAL | wxNO_BORDER, **const wxString&** *name* = *wxPanelNameStr*)

Constructs a toolbar.

Parameters

parent
    Pointer to a parent window.

id
    Window identifier. If -1, will automatically create an identifier.

pos
    Window position. wxDefaultPosition is (-1, -1) which indicates that wxWindows
    should generate a default position for the window. If using the wxWindow class
    directly, supply an actual position.

size
    Window size. wxDefaultSize is (-1, -1) which indicates that wxWindows should
    generate a default size for the window.

style
> Window style. See *wxToolBar* (p. 1123) for details.

name
> Window name.

Remarks

After a toolbar is created, you use *wxToolBar::AddTool* (p. 1126) and perhaps *wxToolBar::AddSeparator* (p. 1126), and then you must call *wxToolBar::Realize* (p. 1135) to construct and display the toolbar tools.

You may also create a toolbar that is managed by the frame, by calling *wxFrame::CreateToolBar* (p. 458).

wxToolBar::~wxToolBar

void ~wxToolBar()

Toolbar destructor.

wxToolBar::AddControl

bool AddControl(**wxControl*** *control*)

Adds any control to the toolbar, typically e.g. a combobox.

control
> The control to be added.

wxToolBar::AddSeparator

void AddSeparator()

Adds a separator for spacing groups of tools.

See also

wxToolBar::AddTool (p. 1126), *wxToolBar::SetToolSeparation* (p. 1138)

wxToolBar::AddTool

wxToolBarTool* AddTool(**int** *toolId*, **const wxBitmap&** *bitmap1*, **const wxString&** *shortHelpString = ""*, **const wxString&** *longHelpString = ""*)

wxToolBarTool* AddTool(**int** *toolId*, **const wxBitmap&** *bitmap1*, **const wxBitmap&**

bitmap2 = wxNullBitmap, **bool** *isToggle = FALSE*, **long** *xPos = -1*, **long** *yPos = -1*,
wxObject* *clientData = NULL*, **const wxString&** *shortHelpString = ""*, **const wxString&**
longHelpString = "")

Adds a tool to the toolbar. The first (short and most commonly used) version adds a
normal (and not a togglable) button without any associated client data.

Parameters

toolId
> An integer by which the tool may be identified in subsequent operations.

isToggle
> Specifies whether the tool is a toggle or not: a toggle tool may be in two states,
> whereas a non-toggle tool is just a button.

bitmap1
> The primary tool bitmap for toggle and button tools.

bitmap2
> The second bitmap specifies the on-state bitmap for a toggle tool. If this is
> wxNullBitmap, either an inverted version of the primary bitmap is used for the on-
> state of a toggle tool (monochrome displays) or a black border is drawn around the
> tool (colour displays) or the pixmap is shown as a pressed button (GTK).

xPos
> Specifies the x position of the tool if automatic layout is not suitable.

yPos
> Specifies the y position of the tool if automatic layout is not suitable.

clientData
> An optional pointer to client data which can be retrieved later using
> *wxToolBar::GetToolClientData* (p. 1130).

shortHelpString
> This string is used for the tools tooltip

longHelpString
> This string is shown in the statusbar (if any) of the parent frame when the mouse
> pointer is inside the tool

Remarks

After you have added tools to a toolbar, you must call *wxToolBar::Realize* (p. 1135) in
order to have the tools appear.

See also

wxToolBar::AddSeparator (p. 1126), *wxToolBar::InsertTool* (p.
1133), *wxToolBar::DeleteTool* (p. 1128), *wxToolBar::Realize* (p. 1135),

wxToolBar::DeleteTool

bool DeleteTool(**int** *toolId*)

Removes the specified tool from the toolbar and deletes it. If you don't want to delete the tool, but just to remove it from the toolbar (to possibly add it back later), you may use *RemoveTool* (p. 1135) instead.

Note that it is unnecessary to call *Realize* (p. 1135) for the change to take place, it will happen immediately.

Returns TRUE if the tool was deleted, FALSE otherwise.

See also

DeleteToolByPos (p. 1128)

wxToolBar::DeleteToolByPos

bool DeleteToolByPos(**size_t** *pos*)

This function behaves like *DeleteTool* (p. 1128) but it deletes the tool at the specified position and not the one with the given id.

wxToolBar::EnableTool

void EnableTool(**int** *toolId*, **const bool** *enable*)

Enables or disables the tool.

Parameters

toolId
    Tool to enable or disable.

enable
    If TRUE, enables the tool, otherwise disables it.

NB: This function should only be called after *Realize* (p. 1135).

Remarks

For wxToolBarSimple, does nothing. Some other implementations will change the visible state of the tool to indicate that it is disabled.

See also

wxToolBar::FindToolForPosition

wxToolBarTool* FindToolForPosition(**const float** *x*, **const float** *y*) **const**

Finds a tool for the given mouse position.

Parameters

x
　　X position.

y
　　Y position.

Return value

A pointer to a tool if a tool is found, or NULL otherwise.

Remarks

Used internally, and should not need to be used by the programmer.

wxToolBar::GetToolSize

wxSize GetToolSize()

Returns the size of a whole button, which is usually larger than a tool bitmap because of added 3D effects.

See also

wxToolBar::SetToolBitmapSize (p. 1136), *wxToolBar::GetToolBitmapSize* (p. 1129)

wxToolBar::GetToolBitmapSize

wxSize GetToolBitmapSize()

Returns the size of bitmap that the toolbar expects to have. The default bitmap size is 16 by 15 pixels.

Remarks

Note that this is the size of the bitmap you pass to *wxToolBar::AddTool* (p. 1126), and not the eventual size of the tool button.

See also

wxToolBar::SetToolBitmapSize (p. 1136), *wxToolBar::GetToolSize* (p. 1129)

wxToolBar::GetMargins

wxSize GetMargins() **const**

Returns the left/right and top/bottom margins, which are also used for inter-toolspacing.

See also

wxToolBar::SetMargins (p. 1135)

wxToolBar::GetToolClientData

wxObject* GetToolClientData(**int** *toolId*) **const**

Get any client data associated with the tool.

Parameters

toolId
Id of the tool, as passed to *wxToolBar::AddTool* (p. 1126).

Return value

Client data, or NULL if there is none.

wxToolBar::GetToolEnabled

bool GetToolEnabled(**int** *toolId*) **const**

Called to determine whether a tool is enabled (responds to user input).

Parameters

toolId
Id of the tool in question.

Return value

TRUE if the tool is enabled, FALSE otherwise.

See also

wxToolBar::GetToolLongHelp

wxString GetToolLongHelp(int *toolId*) const

Returns the long help for the given tool.

Parameters

toolId
    The tool in question.

See also

wxToolBar::SetToolLongHelp (p. 1136), *wxToolBar::SetToolShortHelp* (p. 1137)

wxToolBar::GetToolPacking

int GetToolPacking() const

Returns the value used for packing tools.

See also

wxToolBar::SetToolPacking (p. 1137)

wxToolBar::GetToolSeparation

int GetToolSeparation() const

Returns the default separator size.

See also

wxToolBar::SetToolSeparation (p. 1138)

wxToolBar::GetToolShortHelp

wxString GetToolShortHelp(int *toolId*) const

Returns the short help for the given tool.

Returns the long help for the given tool.

Parameters

toolId
> The tool in question.

See also

wxToolBar::GetToolLongHelp (p. 1131), *wxToolBar::SetToolShortHelp* (p. 1137)

wxToolBar::GetToolState

bool GetToolState(**int** *toolId*) **const**

Gets the on/off state of a toggle tool.

Parameters

toolId
> The tool in question.

Return value

TRUE if the tool is toggled on, FALSE otherwise.

See also

wxToolBar::ToggleTool (p. 1138)

wxToolBar::InsertControl

wxToolBarTool * InsertControl(**size_t** *pos*, **wxControl ****control*)

Inserts the control into the toolbar at the given position.

You must call *Realize* (p. 1135) for the change to take place.

See also

AddControl (p. 1126),
InsertTool (p. 1133)

wxToolBar::InsertSeparator

wxToolBarTool * InsertSeparator(**size_t** *pos*)

Inserts the separator into the toolbar at the given position.

You must call *Realize* (p. 1135) for the change to take place.

See also

AddSeparator (p. 1126),
InsertTool (p. 1133)

wxToolBar::InsertTool

wxToolBarTool * InsertTool(**size_t** *pos*, **int** *toolId*, **const wxBitmap&** *bitmap1*, **const wxBitmap&** *bitmap2 = wxNullBitmap*, **bool** *isToggle = FALSE*, **wxObject*** *clientData = NULL*, **const wxString&** *shortHelpString = ""*, **const wxString&** *longHelpString = ""*)

Inserts the tool with the specified attributes into the toolbar at the given position.

You must call *Realize* (p. 1135) for the change to take place.

See also

AddTool (p. 1126),
InsertControl (p. 1132),
InsertSeparator (p. 1132)

wxToolBar::OnLeftClick

bool OnLeftClick(**int** *toolId*, **bool** *toggleDown*)

Called when the user clicks on a tool with the left mouse button.

This is the old way of detecting tool clicks; although it will still work, you should use the EVT_MENU or EVT_TOOL macro instead.

Parameters

toolId
    The identifier passed to *wxToolBar::AddTool* (p. 1126).

toggleDown
    TRUE if the tool is a toggle and the toggle is down, otherwise is FALSE.

Return value

If the tool is a toggle and this function returns FALSE, the toggle toggle state (internal and visual) will not be changed. This provides a way of specifying that toggle operations are not permitted in some circumstances.

See also

wxToolBar::OnMouseEnter (p. 1134), *wxToolBar::OnRightClick* (p. 1134)

wxToolBar::OnMouseEnter

void OnMouseEnter(int *toolId*)

This is called when the mouse cursor moves into a tool or out of the toolbar.

This is the old way of detecting mouse enter events; although it will still work, you should use the EVT_TOOL_ENTER macro instead.

Parameters

toolId

Greater than -1 if the mouse cursor has moved into the tool, or -1 if the mouse cursor has moved. The programmer can override this to provide extra information about the tool, such as a short description on the status line.

Remarks

With some derived toolbar classes, if the mouse moves quickly out of the toolbar, wxWindows may not be able to detect it. Therefore this function may not always be called when expected.

wxToolBar::OnRightClick

void OnRightClick(int *toolId*, float *x*, float *y*)

Called when the user clicks on a tool with the right mouse button. The programmer should override this function to detect right tool clicks.

This is the old way of detecting tool right clicks; although it will still work, you should use the EVT_TOOL_RCLICKED macro instead.

Parameters

toolId

The identifier passed to *wxToolBar::AddTool* (p. 1126).

x

The x position of the mouse cursor.

y

The y position of the mouse cursor.

Remarks

A typical use of this member might be to pop up a menu.

See also

wxToolBar::OnMouseEnter (p. 1134), *wxToolBar::OnLeftClick* (p. 1133)

wxToolBar::Realize

bool Realize()

This function should be called after you have added tools.

If you are using absolute positions for your tools when using a wxToolBarSimple object, do not call this function. You must call it at all other times.

wxToolBar::RemoveTool

wxToolBarTool * RemoveTool(**int** *id*)

Removes the given tool from the toolbar but doesn't delete it. This allows to insert/add this tool back to this (or another) toolbar later.

Note that it is unnecessary to call *Realize* (p. 1135) for the change to take place, it will happen immediately.

See also

DeleteTool (p. 1128)

wxToolBar::SetMargins

void SetMargins(**const wxSize&** *size*)

void SetMargins(**int** *x*, **int** *y*)

Set the values to be used as margins for the toolbar.

Parameters

size
    Margin size.

x
    Left margin, right margin and inter-tool separation value.

y
    Top margin, bottom margin and inter-tool separation value.

Remarks

This must be called before the tools are added if absolute positioning is to be used, and the default (zero-size) margins are to be overridden.

See also

wxToolBar::GetMargins (p. 1130), *wxSize* (p. 926)

wxToolBar::SetToolBitmapSize

void SetToolBitmapSize(**const wxSize&** *size*)

Sets the default size of each tool bitmap. The default bitmap size is 16 by 15 pixels.

Parameters

size
    The size of the bitmaps in the toolbar.

Remarks

This should be called to tell the toolbar what the tool bitmap size is. Call it before you add tools.

Note that this is the size of the bitmap you pass to *wxToolBar::AddTool* (p. 1126), and not the eventual size of the tool button.

See also

wxToolBar::GetToolBitmapSize (p. 1129), *wxToolBar::GetToolSize* (p. 1129)

wxToolBar::SetToolClientData

void GetToolClientData(**wxObject*** *clientData*)

Sets the client data associated with the tool.

wxToolBar::SetToolLongHelp

void SetToolLongHelp(**int** *toolId*, **const wxString&** *helpString*)

Sets the long help for the given tool.

Parameters

toolId
    The tool in question.

helpString
> A string for the long help.

Remarks

You might use the long help for displaying the tool purpose on the status line.

See also

wxToolBar::GetToolLongHelp (p. 1131), *wxToolBar::SetToolShortHelp* (p. 1137),

wxToolBar::SetToolPacking

void SetToolPacking(**int** *packing*)

Sets the value used for spacing tools. The default value is 1.

Parameters

packing
> The value for packing.

Remarks

The packing is used for spacing in the vertical direction if the toolbar is horizontal, and for spacing in the horizontal direction if the toolbar is vertical.

See also

wxToolBar::GetToolPacking (p. 1131)

wxToolBar::SetToolShortHelp

void SetToolShortHelp(**int** *toolId*, **const wxString&** *helpString*)

Sets the short help for the given tool.

Parameters

toolId
> The tool in question.

helpString
> The string for the short help.

Remarks

An application might use short help for identifying the tool purpose in a tooltip.

See also

wxToolBar::GetToolShortHelp (p. 1131), *wxToolBar::SetToolLongHelp* (p. 1136)

wxToolBar::SetToolSeparation

void SetToolSeparation(**int** *separation*)

Sets the default separator size. The default value is 5.

Parameters

separation
    The separator size.

See also

wxToolBar::AddSeparator (p. 1126)

wxToolBar::ToggleTool

void ToggleTool(**int** *toolId*, **const bool** *toggle*)

Toggles a tool on or off. This does not cause any event to get emitted.

Parameters

toolId
    Tool in question.

toggle
    If TRUE, toggles the tool on, otherwise toggles it off.

Remarks

Only applies to a tool that has been specified as a toggle tool.

See also

wxToolBar::GetToolState (p. 1132)

wxToolTip

This class holds information about a tooltip associated with a window (see *wxWindow::SetToolTip* (p. 1237)).

The two static methods, *wxToolTip::Enable* (p. 1139) and *wxToolTip::SetDelay* (p. 1139) can be used to globally alter tooltips behaviour.

Derived from

wxObject (p. 750)

wxToolTip::Enable

static void Enable(**bool** *flag*)

Enable or disable tooltips globally.

wxToolTip::SetDelay

static void SetDelay(**long** *msecs*)

Set the delay after which the tooltip appears.

wxToolTip::wxToolTip

wxToolTip(**const wxString&** *tip*)

Constructor.

wxToolTip::SetTip

void SetTip(**const wxString&** *tip*)

Set the tooltip text.

wxToolTip::GetTip

wxString GetTip() **const**

Get the tooltip text.

wxToolTip::GetWindow

wxWindow* **GetWindow**() **const**

Get the associated window.

wxTreeCtrl

A tree control presents information as a hierarchy, with items that may be expanded to show further items. Items in a tree control are referenced by wxTreeItemId handles. The only method of wxTreeItemId class which can be used is *IsOk()* which returns TRUE if the handle is valid and FALSE otherwise.

To intercept events from a tree control, use the event table macros described in *wxTreeEvent* (p. 1156).

Derived from

wxControl (p. 177)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/treectrl.h>

Window styles

wxTR_HAS_BUTTONS	Use this style to show + and - buttons to the left of parent items. Win32 only.
wxTR_EDIT_LABELS	Use this style if you wish the user to be able to edit labels in the tree control.
wxTR_MULTIPLE	Use this style to allow the user to select more than one item in the control - by default, only one item may be selected.

See also *window styles overview* (p. 1379).

Event handling

To process input from a tree control, use these event handler macros to direct input to member functions that take a *wxTreeEvent* (p. 1156) argument.

EVT_TREE_BEGIN_DRAG(id, func)	Begin dragging with the left mouse button.
EVT_TREE_BEGIN_RDRAG(id, func)	Begin dragging with the right mouse button.
EVT_TREE_END_DRAG(id, func)	Drag ended (drop).

EVT_TREE_BEGIN_LABEL_EDIT(id, func) Begin editing a label. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_END_LABEL_EDIT(id, func) Finish editing a label. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_DELETE_ITEM(id, func) Delete an item.
EVT_TREE_GET_INFO(id, func) Request information from the application.
EVT_TREE_SET_INFO(id, func) Information is being supplied.
EVT_TREE_ITEM_ACTIVATED(id, func) The item has been activated, i.e. chosen by double clicking it with mouse or from keyboard
EVT_TREE_ITEM_COLLAPSED(id, func) Parent has been collapsed.
EVT_TREE_ITEM_COLLAPSING(id, func) Parent is being collapsed. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_ITEM_EXPANDED(id, func) Parent has been expanded.
EVT_TREE_ITEM_EXPANDING(id, func) Parent is being expanded. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_SEL_CHANGED(id, func) Selection has changed.
EVT_TREE_SEL_CHANGING(id, func) Selection is changing. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_KEY_DOWN(id, func) A key has been pressed.

Note that to allow drag and drop in the tree control you must explicitly call *Allow()* (p. 750) in the event handler, by default dragging is disabled. On the other hand, label editing is allowed by default for the controls with **wxTR_EDIT_LABELS** style but you can call *Veto()* (p. 750) to prevent it from happening.

See also

wxTreeItemData (p. 1155), *wxTreeCtrl overview* (p. 1405), *wxListBox* (p. 625), *wxListCtrl* (p. 634), *wxImageList* (p. 587), *wxTreeEvent* (p. 1156)

Win32 notes

wxTreeCtrl class uses the standard common treeview control under Win32 implemented in the system library `comctl32.dll`. Some versions of this library are known to have bugs with handling the tree control colours: the usual symptom is that the expanded items leave black (or otherwise incorrectly coloured) background behind them, especially for the controls using non default background colour. The recommended solution is to upgrade the `comctl32.dll` to a newer version:
seehttp://www.microsoft.com/msdownload/ieplatform/ie/comctrlx86.asp
(`http://www.microsoft.com/msdownload/ieplatform/ie/comctrlx86.asp`)
.

wxTreeCtrl::wxTreeCtrl

wxTreeCtrl()

Default constructor.

 wxTreeCtrl(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *wxTR_HAS_BUTTONS*, **const wxValidator&** *validator* = *wxDefaultValidator*, **const wxString&** *name* = *"listCtrl"*)

Constructor, creating and showing a tree control.

Parameters

parent
    Parent window. Must not be NULL.

id
    Window identifier. A value of -1 indicates a default value.

pos
    Window position.

size
    Window size. If the default size (-1, -1) is specified then the window is sized appropriately.

style
    Window style. See *wxTreeCtrl* (p. 1140).

validator
    Window validator.

name
    Window name.

See also

wxTreeCtrl::Create (p. 1143), *wxValidator* (p. 1172)

wxTreeCtrl::~wxTreeCtrl

void ~wxTreeCtrl()

Destructor, destroying the list control.

wxTreeCtrl::AddRoot

wxTreeItemId AddRoot(**const wxString&** *text*, **int** *image = -1*, **int** *selImage = -1*, **wxTreeItemData*** *data = NULL*)

Adds the root node to the tree, returning the new item.

If *image* > -1 and *selImage* is -1, the same image is used for both selected and unselected items.

wxTreeCtrl::AppendItem

wxTreeItemId AppendItem(**const wxTreeItemId&** *parent*, **const wxString&** *text*, **int** *image = -1*, **int** *selImage = -1*, **wxTreeItemData*** *data = NULL*)

Appends an item to the end of the branch identified by *parent*, return a new item id.

If *image* > -1 and *selImage* is -1, the same image is used for both selected and unselected items.

wxTreeCtrl::Collapse

void Collapse(**const wxTreeItemId&** *item*)

Collapses the given item.

wxTreeCtrl::CollapseAndReset

void CollapseAndReset(**const wxTreeItemId&** *item*)

Collapses the given item and removes all children.

wxTreeCtrl::Create

bool wxTreeCtrl(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos = wxDefaultPosition*, **const wxSize&** *size = wxDefaultSize*, **long** *style = wxTR_HAS_BUTTONS*, **const wxValidator&** *validator = wxDefaultValidator*, **const wxString&** *name = "listCtrl"*)

Creates the tree control. See *wxTreeCtrl::wxTreeCtrl* (p. 1141) for further details.

wxTreeCtrl::Delete

void Delete(**const wxTreeItemId&** *item*)

Deletes the specified item.

wxTreeCtrl::DeleteAllItems

void DeleteAllItems()

Deletes all the items in the control.

wxTreeCtrl::EditLabel

void EditLabel(**const wxTreeItemId&** *item*)

Starts editing the label of the given item. This function generates a EVT_TREE_BEGIN_LABEL_EDIT event which can be vetoed so that no text control will appear for in-place editing.

If the user changed the label (i.e. s/he does not press ESC or leave the text control without changes, a EVT_TREE_END_LABEL_EDIT event will be sent which can be vetoed as well.

See also

wxTreeCtrl::EndEditLabel (p. 1144), *wxTreeEvent* (p. 1156)

wxTreeCtrl::EndEditLabel

void EndEditLabel(**bool** *cancelEdit*)

Ends label editing. If *cancelEdit* is TRUE, the edit will be cancelled.

This function is currently supported under Windows only.

See also

wxTreeCtrl::EditLabel (p. 1144)

wxTreeCtrl::EnsureVisible

void EnsureVisible(**const wxTreeItemId&** *item*)

Scrolls and/or expands items to ensure that the given item is visible.

wxTreeCtrl::Expand

void Expand(**const wxTreeItemId&** *item*)

Expands the given item.

wxTreeCtrl::GetBoundingRect

bool GetBoundingRect(**const wxTreeItemId&** *item*, **wxRect&** *rect*, **bool** *textOnly =
FALSE*) **const**

Retrieves the rectangle bounding the *item*. If *textOnly* is TRUE, only the rectangle
around the items label will be returned, otherwise the items image is also taken into
account.

The return value is TRUE if the rectangle was successfully retrieved or FALSE if it was
not (in this case *rect* is not changed) - for example, if the item is currently invisible.

wxPython note: The wxPython version of this method requires only the item and
textOnly parameters. The return value is either a wxRect object or None.

wxTreeCtrl::GetChildrenCount

size_t GetChildrenCount(**const wxTreeItemId&** *item*, **bool** *recursively = TRUE*) **const**

Returns the number of items in the branch. If *recursively* is TRUE, returns the total
number of descendants, otherwise only one level of children is counted.

wxTreeCtrl::GetCount

int GetCount() **const**

Returns the number of items in the control.

wxTreeCtrl::GetEditControl

wxTextCtrl& GetEditControl() **const**

Returns the edit control used to edit a label.

wxTreeCtrl::GetFirstChild

wxTreeItemId GetFirstChild(**const wxTreeItemId&** *item*, **long&** *cookie*) **const**

Returns the first child; call *wxTreeCtrl::GetNextChild* (p. 1147) for the next child.

For this enumeration function you must pass in a 'cookie' parameter which is opaque for
the application but is necessary for the library to make these functions reentrant (i.e.
allow more than one enumeration on one and the same object simultaneously). The
cookie passed to GetFirstChild and GetNextChild should be the same.

Returns an invalid tree item if there are no further children.

See also

wxTreeCtrl::GetNextChild (p. 1147)

wxPython note: In wxPython the returned wxTreeItemId and the new cookie value are both returned as a tuple containing the two values.

wxTreeCtrl::GetFirstVisibleItem

wxTreeItemId GetFirstVisibleItem() const

Returns the first visible item.

wxTreeCtrl::GetImageList

wxImageList* GetImageList() const

Returns the normal image list.

wxTreeCtrl::GetIndent

int GetIndent() const

Returns the current tree control indentation.

wxTreeCtrl::GetItemData

wxTreeItemData* GetItemData(const wxTreeItemId& *item*) const

Returns the tree item data associated with the item.

See also

wxTreeItemData (p. 1155)

wxPython note: wxPython provides the following shortcut method:

GetPyData(item)	Returns the Python Object associated with the wxTreeItemData for the given item Id.

wxTreeCtrl::GetItemImage

int GetItemImage(**const wxTreeItemId&** *item*, **wxTreeItemIcon** *which* = *wxTreeItemIcon_Normal*) **const**

Gets the specified item image. The value of *which* may be:

- _Normal to get the normal item image
- _Selected to get the selected item image (i.e. the image which is shown when the item is currently selected)
- _Expanded to get the expanded image (this only makes sense for items which have children - then this image is shown when the item is expanded and the normal image is shown when it is collapsed)
- _SelectedExpanded to get the selected expanded image (which is shown when an expanded item is currently selected)

wxTreeCtrl::GetItemText

wxString GetItemText(**const wxTreeItemId&** *item*) **const**

Returns the item label.

wxTreeCtrl::GetLastChild

wxTreeItemId GetLastChild(**const wxTreeItemId&** *item*) **const**

Returns the last child of the item (or an invalid tree item if this item has no children).

See also

GetFirstChild (p. 1145), *GetLastChild* (p. 1147)

wxTreeCtrl::GetNextChild

wxTreeItemId GetNextChild(**const wxTreeItemId&** *item*, **long&** *cookie*) **const**

Returns the next child; call *wxTreeCtrl::GetFirstChild* (p. 1145) for the first child.

For this enumeration function you must pass in a 'cookie' parameter which is opaque for the application but is necessary for the library to make these functions reentrant (i.e. allow more than one enumeration on one and the same object simultaneously). The cookie passed to GetFirstChild and GetNextChild should be the same.

Returns an invalid tree item if there are no further children.

See also

wxTreeCtrl::GetFirstChild (p. 1145)

wxPython note: In wxPython the returned wxTreeItemId and the new cookie value are both returned as a tuple containing the two values.

wxTreeCtrl::GetNextSibling

wxTreeItemId GetNextSibling(**const wxTreeItemId&** *item*) **const**

Returns the next sibling of the specified item; call *wxTreeCtrl::GetPrevSibling* (p. 1148) for the previous sibling.

Returns an invalid tree item if there are no further siblings.

See also

wxTreeCtrl::GetPrevSibling (p. 1148)

wxTreeCtrl::GetNextVisible

wxTreeItemId GetNextVisible(**const wxTreeItemId&** *item*) **const**

Returns the next visible item.

wxTreeCtrl::GetParent

wxTreeItemId GetParent(**const wxTreeItemId&** *item*) **const**

Returns the item's parent.

wxPython note: This method is named GetItemParent to avoid a name clash with wxWindow::GetParent.

wxTreeCtrl::GetPrevSibling

wxTreeItemId GetPrevSibling(**const wxTreeItemId&** *item*) **const**

Returns the previous sibling of the specified item; call *wxTreeCtrl::GetNextSibling* (p. 1148) for the next sibling.

Returns an invalid tree item if there are no further children.

See also

wxTreeCtrl::GetNextSibling (p. 1148)

wxTreeCtrl::GetPrevVisible

wxTreeItemId GetPrevVisible(const wxTreeItemId& *item*) const

Returns the previous visible item.

wxTreeCtrl::GetRootItem

wxTreeItemId GetRootItem() const

Returns the root item for the tree control.

wxTreeCtrl::GetItemSelectedImage

int GetItemSelectedImage(const wxTreeItemId& *item*) const

Gets the selected item image (this function is obsolete, use`GetItemImage(item, wxTreeItemIcon_Selected`) instead).

wxTreeCtrl::GetSelection

wxTreeItemId GetSelection() const

Returns the selection, or an invalid item if there is no selection. This function only works with the controls without wxTR_MULTIPLE style, use*GetSelections* (p. 1149) for the controls which do have this style.

wxTreeCtrl::GetSelections

size_t GetSelections(wxArrayTreeItemIds& *selection*) const

Fills the array of tree items passed in with the currently selected items. This function can be called only if the control has the wxTR_MULTIPLE style.

Returns the number of selected items.

wxPython note: The wxPython version of this method accepts no parameters and returns a Python list of `wxTreeItemId`s.

wxTreeCtrl::GetStateImageList

wxImageList* GetStateImageList() const

Returns the state image list (from which application-defined state images are taken).

wxTreeCtrl::HitTest

wxTreeItemId HitTest(**const wxPoint&** *point*, **int&** *flags*)

Calculates which (if any) item is under the given point, returning the tree item id at this point plus extra information *flags*. *flags* is a bitlist of the following:

wxTREE_HITTEST_ABOVE Above the client area.
wxTREE_HITTEST_BELOW Below the client area.
wxTREE_HITTEST_NOWHERE   In the client area but below the last item.
wxTREE_HITTEST_ONITEMBUTTON   On the button associated with an item.
wxTREE_HITTEST_ONITEMICON On the bitmap associated with an item.
wxTREE_HITTEST_ONITEMINDENT   In the indentation associated with an item.
wxTREE_HITTEST_ONITEMLABEL On the label (string) associated with an item.
wxTREE_HITTEST_ONITEMRIGHT In the area to the right of an item.
wxTREE_HITTEST_ONITEMSTATEICON   On the state icon for a tree view item that is
                        in a user-defined state.
wxTREE_HITTEST_TOLEFTTo the right of the client area.
wxTREE_HITTEST_TORIGHT   To the left of the client area.

wxPython note: in wxPython both the wxTreeItemId and the flags are returned as a tuple.

wxTreeCtrl::InsertItem

wxTreeItemId InsertItem(const wxTreeItemId& *parent*, **const wxTreeItemId&** *previous*, **const wxString&** *text*, **int** *image = -1*, **int** *selImage = -1*, **wxTreeItemData*** *data = NULL*)

wxTreeItemId InsertItem(const wxTreeItemId& *parent*, **size_t** *before*, **const wxString&** *text*, **int** *image = -1*, **int** *selImage = -1*, **wxTreeItemData*** *data = NULL*)

Inserts an item after a given one (*previous*) or before one identified by its position (*before*).

If *image* > -1 and *selImage* is -1, the same image is used for both selected and unselected items.

wxPython note: The second form of this method is called InsertItemBefore in wxPython.

wxTreeCtrl::IsBold

bool IsBold(**const wxTreeItemId&** *item*) **const**

Returns TRUE if the given item is in bold state.

See also: *SetItemBold* (p. 1152)

wxTreeCtrl::IsExpanded

bool IsExpanded(**const wxTreeItemId&** *item*) **const**

Returns TRUE if the item is expanded (only makes sense if it has children).

wxTreeCtrl::IsSelected

bool IsSelected(**const wxTreeItemId&** *item*) **const**

Returns TRUE if the item is selected.

wxTreeCtrl::IsVisible

bool IsVisible(**const wxTreeItemId&** *item*) **const**

Returns TRUE if the item is visible (it might be outside the view, or not expanded).

wxTreeCtrl::ItemHasChildren

bool ItemHasChildren(**const wxTreeItemId&** *item*) **const**

Returns TRUE if the item has children.

wxTreeCtrl::OnCompareItems

int OnCompareItems(**const wxTreeItemId&** *item1*, **const wxTreeItemId&** *item2*)

Override this function in the derived class to change the sort order of the items in the tree control. The function should return a negative, zero or positive value if the first item is less than, equal to or greater than the second one.

The base class version compares items alphabetically.

See also: *SortChildren* (p. 1154)

wxTreeCtrl::PrependItem

wxTreeItemId PrependItem(const wxTreeItemId& *parent*, **const wxString&** *text*, **int**

image = -1, **int** *sellmage = -1*, **wxTreeItemData*** *data = NULL*)

Appends an item as the first child of *parent*, return a new item id.

If *image* > -1 and *sellmage* is -1, the same image is used for both selected and unselected items.

wxTreeCtrl::ScrollTo

void ScrollTo(**const wxTreeItemId&** *item*)

Scrolls the specified item into view.

wxTreeCtrl::SelectItem

bool SelectItem(**const wxTreeItemId&** *item*)

Selects the given item.

wxTreeCtrl::SetIndent

void SetIndent(**int** *indent*)

Sets the indentation for the tree control.

wxTreeCtrl::SetImageList

void SetImageList(**wxImageList*** *imageList*)

Sets the normal image list.

wxTreeCtrl::SetItemBackgroundColour

void SetItemBackgroundColour(**const wxTreeItemId&** *item*, **const wxColour&** *col*)

Sets the colour of the items background.

wxTreeCtrl::SetItemBold

void SetItemBold(**const wxTreeItemId&** *item*, **bool** *bold = TRUE*)

Makes item appear in bold font if *bold* parameter is TRUE or resets it to the normal state.

See also: *IsBold* (p. 1150)

wxTreeCtrl::SetItemData

void SetItemData(**const wxTreeItemId&** *item*, **wxTreeItemData*** *data*)

Sets the item client data.

wxPython note: wxPython provides the following shortcut method:

SetPyData(item, obj) Associate the given Python Object with the wxTreeItemData for the given item Id.

wxTreeCtrl::SetItemFont

void SetItemFont(**const wxTreeItemId&** *item*, **const wxFont&** *font*)

Sets the items font. All items in the tree should have the same height to avoid text clipping, so the fonts height should be the same for all of them, although font attributes may vary.

See also

SetItemBold (p. 1152)

wxTreeCtrl::SetItemHasChildren

void SetItemHasChildren(**const wxTreeItemId&** *item*, **bool** *hasChildren = TRUE*)

Force appearance of the button next to the item. This is useful to allow the user to expand the items which don't have any children now, but instead adding them only when needed, thus minimizing memory usage and loading time.

wxTreeCtrl::SetItemImage

void SetItemImage(**const wxTreeItemId&** *item*, **int** *image*, **wxTreeItemIcon** *which =* *wxTreeItemIcon_Normal*)

Sets the specified item image. See *GetItemImage* (p. 1146)for the description of the *which* parameter.

wxTreeCtrl::SetItemSelectedImage

void SetItemSelectedImage(**const wxTreeItemId&** *item*, **int** *selImage*)

Sets the selected item image (this function is obsolete, use `SetItemImage(item, wxTreeItemIcon_Selected)` instead).

wxTreeCtrl::SetItemText

void SetItemText(const wxTreeItemId& *item*, **const wxString&** *text*)

Sets the item label.

wxTreeCtrl::SetItemTextColour

void SetItemTextColour(**const wxTreeItemId&** *item*, **const wxColour&** *col*)

Sets the colour of the items text.

wxTreeCtrl::SetStateImageList

void SetStateImageList(**wxImageList*** *imageList*)

Sets the state image list (from which application-defined state images are taken).

wxTreeCtrl::SortChildren

void SortChildren(const wxTreeItemId& *item*)

Sorts the children of the given item using *OnCompareItems* (p. 1151) method of wxTreeCtrl. You should override that method to change the sort order (the default is ascending alphabetical order).

See also

wxTreeItemData (p. 1155), *OnCompareItems* (p. 1151)

wxTreeCtrl::Toggle

void Toggle (**const wxTreeItemId&** *item*)

Toggles the given item between collapsed and expanded states.

wxTreeCtrl::Unselect

void Unselect()

Removes the selection from the currently selected item (if any).

wxTreeCtrl::UnselectAll

void UnselectAll()

This function either behaves the same as *Unselect* (p. 1154)if the control doesn't have wxTR_MULTIPLE style, or removes the selection from all items if it does have this style.

wxTreeItemData

wxTreeItemData is some (arbitrary) user class associated with some item. The main advantage of having this class (compared to the old untyped interface) is that wxTreeItemData's are destroyed automatically by the tree and, as this class has virtual dtor, it means that the memory will be automatically freed. We don't just use wxObject instead of wxTreeItemData because the size of this class is critical: in any real application, each tree leaf will have wxTreeItemData associated with it and number of leaves may be quite big.

Because the objects of this class are deleted by the tree, they should always be allocated on the heap.

Derived from

wxTreeItemId

Include files

<wx/treectrl.h>

See also

wxTreeCtrl (p. 1140)

wxTreeItemData::wxTreeItemData

wxTreeItemData()

Default constructor.

wxPython note: The wxPython version of this constructor optionally accepts any Python object as a parameter. This object is then associated with the tree item using the

wxTreeItemData as a container.

In addition, the following methods are added in wxPython for accessing the object:

GetData()	Returns a reference to the Python Object
SetData(obj)	Associates a new Python Object with the wxTreeItemData

wxTreeItemData::~wxTreeItemData

void ~wxTreeItemData()

Virtual destructor.

wxTreeItemData::GetId

const wxTreeItem& GetId()

Returns the item associated with this node.

wxTreeItemData::SetId

void SetId(**const wxTreeItemId&** *id*)

Sets the item associated with this node.

wxTreeEvent

A tree event holds information about events associated with wxTreeCtrl objects.

Derived from

wxNotifyEvent (p. 749)
wxCommandEvent (p. 153)
wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/treectrl.h>

Event table macros

To process input from a tree control, use these event handler macros to direct input to member functions that take a wxTreeEvent argument.

EVT_TREE_BEGIN_DRAG(id, func)   Begin dragging with the left mouse button.
EVT_TREE_BEGIN_RDRAG(id, func)   Begin dragging with the right mouse button.
EVT_TREE_END_DRAG(id, func)   Drag ended (drop).
EVT_TREE_BEGIN_LABEL_EDIT(id, func)   Begin editing a label. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_END_LABEL_EDIT(id, func)   Finish editing a label. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_DELETE_ITEM(id, func)   Delete an item.
EVT_TREE_GET_INFO(id, func)   Request information from the application.
EVT_TREE_SET_INFO(id, func)   Information is being supplied.
EVT_TREE_ITEM_EXPANDED(id, func)   Parent has been expanded.
EVT_TREE_ITEM_EXPANDING(id, func)   Parent is being expanded. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_SEL_CHANGED(id, func)   Selection has changed.
EVT_TREE_SEL_CHANGING(id, func)   Selection is changing. This can be prevented by calling *Veto()* (p. 750).
EVT_TREE_KEY_DOWN(id, func)   A key has been pressed.

See also

wxTreeCtrl (p. 1140)

wxTreeEvent::wxTreeEvent

 wxTreeEvent(**WXTYPE** *commandType = 0*, **int** *id = 0*)

Constructor.

wxTreeEvent::GetItem

wxTreeItemId GetItem() **const**

Returns he item (valid for all events).

wxTreeEvent::GetOldItem

wxTreeItemId GetOldItem() **const**

Returns the old item index (valid for EVT_TREE_ITEM_CHANGING and CHANGED events)

wxTreeEvent::GetPoint()

wxPoint GetPoint() **const**

Returns the position of the mouse pointer if the event is a drag or a click event.

wxTreeEvent::GetCode

int GetCode() **const**

The key code if the event was is a key event.

wxTreeEvent::GetLabel

const wxString& GetLabel() **const**

Returns the label if the event was a begin or end edit label event.

wxTreeLayout

wxTreeLayout provides layout of simple trees with one root node, drawn left-to-right, with user-defined spacing between nodes.

wxTreeLayout is an abstract class that must be subclassed. The programmer defines various member functions which will access whatever data structures are appropriate for the application, and wxTreeLayout uses these when laying out the tree.

Nodes are identified by long integer identifiers. The derived class communicates the actual tree structure to wxTreeLayout by defining *wxTreeLayout::GetChildren* (p. 1161) and *wxTreeLayout::GetNodeParent* (p. 1161) functions.

The application should call *wxTreeLayout::DoLayout* (p. 1160) to do the tree layout. Depending on how the derived class has been defined, either *wxTreeLayout::Draw* (p. 1160) must be called (for example by the OnPaint member of a wxScrolledWindow) or the application-defined drawing code should be called as normal.

For example, if you have an image drawing system already defined, you may want wxTreeLayout to position existing node images in that system. So you just need a way for wxTreeLayout to set the node image positions according to the layout algorithm, and the rest will be done by your own image drawing system.

The algorithm is due to Gabriel Robins [1], a linear-time algorithm originally implemented in LISP for AI applications.

The original algorithm has been modified so that both X and Y planes are calculated simultaneously, increasing efficiency slightly. The basic code is only a page or so long.

Below is the example tree generated by the program test.cc.
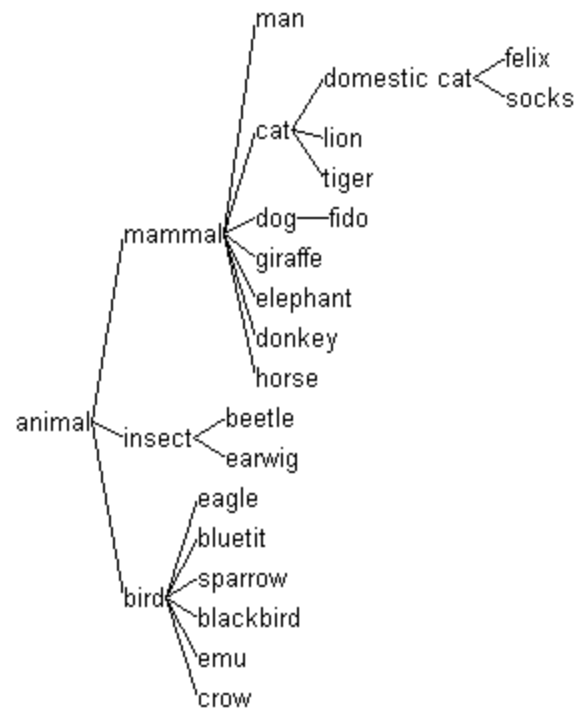
Figure 1: Example tree

Derived from

wxObject

See also

wxTreeLayoutStored (p. 1164)

wxTreeLayout::wxTreeLayout

wxTreeLayout()

Constructor.

wxTreeLayout::ActivateNode

void ActivateNode (**long** *id*, **bool** *active*)

Define this so wxTreeLayout can turn nodes on and off for drawing purposes (not all nodes may be connected in the tree). See also *wxTreeLayout::NodeActive* (p. 1163).

wxTreeLayout::CalcLayout

void CalcLayout(**long** *id*, **int** *level*)

Private function for laying out a branch.

wxTreeLayout::DoLayout

void DoLayout(**wxDC&** *dc*, **long** *topNode = -1*)

Calculates the layout for the tree, optionally specifying the top node.

wxTreeLayout::Draw

void Draw(**wxDC&** *dc*)

Call this to let wxTreeLayout draw the tree itself, once the layout has been calculated with *wxTreeLayout::DoLayout* (p. 1160).

wxTreeLayout::DrawBranch

void DrawBranch(**long** *from*, **long** *to*, **wxDC&** *dc*)

Defined by wxTreeLayout to draw an arc between two nodes.

wxTreeLayout::DrawBranches

void DrawBranches(**wxDC&** *dc*)

Defined by wxTreeLayout to draw the arcs between nodes.

wxTreeLayout::DrawNode

void DrawNode (**long** *id*, **wxDC&** *dc*)

Defined by wxTreeLayout to draw a node.

wxTreeLayout::DrawNodes

void DrawNodes(**wxDC&** *dc*)

Defined by wxTreeLayout to draw the nodes.

wxTreeLayout::GetChildren

void GetChildren(**long** *id*, **wxList &***list*)

Must be defined to return the children of node *id* in the given list of integers.

wxTreeLayout::GetNextNode

long GetNextNode(**long** *id*)

Must be defined to return the next node after *id*, so that wxTreeLayout can iterate through all relevant nodes. The ordering is not important. The function should return -1 if there are no more nodes.

wxTreeLayout::GetNodeName

wxString GetNodeName(**long** *id*) const

May optionally be defined to get a node's name (for example if leaving the drawing to wxTreeLayout).

wxTreeLayout::GetNodeSize

void GetNodeSize(**long** *id*, **long*** *x*, **long*** *y*) const

Can be defined to indicate a node's size, or left to wxTreeLayout to use the name as an indication of size.

wxTreeLayout::GetNodeParent

long GetNodeParent(**long** *id*) const

Must be defined to return the parent node of *id*. The function should return -1 if there is no parent.

wxTreeLayout::GetNodeX

long GetNodeX(**long** *id*) **const**

Must be defined to return the current X position of the node. Note that coordinates are assumed to be at the top-left of the node so some conversion may be necessary for your application.

wxTreeLayout::GetNodeY

long GetNodeY(**long** *id*) **const**

Must be defined to return the current Y position of the node. Note that coordinates are assumed to be at the top-left of the node so some conversion may be necessary for your application.

wxTreeLayout::GetLeftMargin

long GetLeftMargin() **const**

Gets the left margin set with *wxTreeLayout::SetMargins* (p. 1164).

wxTreeLayout::GetOrientation

bool GetOrientation() **const**

Gets the orientation: TRUE means top-to-bottom, FALSE means left-to-right (the default).

wxTreeLayout::GetTopMargin

long GetTopMargin() **const**

Gets the top margin set with *wxTreeLayout::SetMargins* (p. 1164).

wxTreeLayout::GetTopNode

long GetTopNode() **const**

wxTreeLayout calls this to get the top of the tree. Don't redefine this; call *wxTreeLayout::SetTopNode* (p. 1164) instead before calling *wxTreeLayout::DoLayout* (p. 1160).

wxTreeLayout::GetXSpacing

long GetXSpacing() **const**

Gets the horizontal spacing between nodes.

wxTreeLayout::GetYSpacing

long GetYSpacing() **const**

Gets the vertical spacing between nodes.

wxTreeLayout::Initialize

void Initialize()

Initializes wxTreeLayout. Call from application or overridden **Initialize**or constructor.

wxTreeLayout::NodeActive

bool NodeActive(**long** *id*)

Define this so wxTreeLayout can know which nodes are to be drawn (not all nodes may be connected in the tree). See also *wxTreeLayout::ActivateNode* (p. 1159).

wxTreeLayout::SetNodeName

void SetNodeName(**long** *id*, **const wxString&** *name*)

May optionally be defined to set a node's name.

wxTreeLayout::SetNodeX

void SetNodeX(**long** *id*, **long** *x*)

Must be defined to set the current X position of the node. Note that coordinates are assumed to be at the top-left of the node so some conversion may be necessary for your application.

wxTreeLayout::SetNodeY

void SetNodeY(**long** *id*, **long** *y*)

Must be defined to set the current Y position of the node. Note that coordinates are assumed to be at the top-left of the node so some conversion may be necessary for your application.

wxTreeLayout::SetOrientation

void SetOrientation(**bool** *orientation*)

Sets the tree orientation: TRUE means top-to-bottom, FALSE means left-to-right (the default).

wxTreeLayout::SetTopNode

void SetTopNode(**long** *id*)

Call this to identify the top of the tree to wxTreeLayout.

wxTreeLayout::SetSpacing

void SetSpacing(**long** *x*, **long** *y*)

Sets the horizontal and vertical spacing between nodes in the tree.

wxTreeLayout::SetMargins

void SetMargins(**long** *x*, **long** *y*)

Sets the left and top margins of the whole tree.

wxTreeLayoutStored

wxTreeLayoutStored provides storage for node labels, position and client data. It also provides hit-testing (which node a mouse event occurred on). It is usually a more convenient class to use than wxTreeLayout.

Derived from

wxTreeLayout (p. 1158)
wxObject (p. 750)

See also

wxTreeLayoutStored::wxTreeLayoutStored

wxTreeLayoutStored(**int** *noNodes = 200*)

Constructor. Specify the maximum number of nodes to be allocated.

wxTreeLayoutStored::AddChild

long AddChild(**const wxString&** *name*, **const wxString&** *parent = ""*)

Adds a child with a given parent, returning the node id.

wxTreeLayoutStored::GetClientData

long GetClientData(**long** *id*) **const**

Gets the client data for the given node.

wxTreeLayoutStored::GetNode

wxStoredNode* GetNode(**long** *id*) **const**

Returns the wxStoredNode object for the given node id.

wxTreeLayoutStored::GetNodeCount

int GetNodeCount() **const**

Returns the current number of nodes.

wxTreeLayoutStored::GetNumNodes

int GetNumNodes() **const**

Returns the maximum number of nodes.

wxTreeLayoutStored::HitTest

wxString HitTest(**wxMouseEvent&** *event*, **wxDC&** *dc*)

Returns a string with the node name corresponding to the position of the mouse event, or the empty string if no node was detected.

wxTreeLayoutStored::NameToId

long NameToId(**const wxString&** *name*)

Returns the id for the given node name, or -1 if there was no such node.

wxTreeLayoutStored::SetClientData

void SetClientData(**long** *id*, **long** *clientData*)

Sets client data for the given node.

wxUpdateUIEvent

This class is used for pseudo-events which are called by wxWindows to give an application the chance to update various user interface elements.

Derived from

wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/event.h>

Event table macros

To process an update event, use these event handler macros to direct input to member functions that take a wxUpdateUIEvent argument.

EVT_UPDATE_UI(id, func)	Process a wxEVT_UPDATE_UI event for the command with the given id.
EVT_UPDATE_UI_RANGE(id1, id2, func)	Process a wxEVT_UPDATE_UI event for any command with id included in the given range.

Remarks

Without update UI events, an application has to work hard to check/uncheck, enable/disable, and set the text for elements such as menu items and toolbar buttons. The code for doing this has to be mixed up with the code that is invoked when an action is invoked for a menu item or button.

With update UI events, you define an event handler to look at the state of the application and change UI elements accordingly. wxWindows will call your member functions in idle time, so you don't have to worry where to call this code. In addition to being a clearer and more declarative method, it also means you don't have to worry whether you're updating a toolbar or menubar identifier. The same handler can update a menu item and toolbar button, if the identifier is the same.

Instead of directly manipulating the menu or button, you call functions in the event object, such as *wxUpdateUIEvent::Check* (p. 1168). wxWindows will determine whether such a call has been made, and which UI element to update.

These events will work for popup menus as well as menubars. Just before a menu is popped up, *wxMenu::UpdateUI* (p. 697) is called to process any UI events for the window that owns the menu.

See also

Event handling overview (p. 1372)

wxUpdateUIEvent::wxUpdateUIEvent

wxUpdateUIEvent(**wxWindowID** *commandId = 0*)

Constructor.

wxUpdateUIEvent::m_checked

bool m_checked

TRUE if the element should be checked, FALSE otherwise.

wxUpdateUIEvent::m_enabled

bool m_checked

TRUE if the element should be enabled, FALSE otherwise.

wxUpdateUIEvent::m_setChecked

bool m_setChecked

TRUE if the application has set the **m_checked** member.

wxUpdateUIEvent::m_setEnabled

bool m_setEnabled

TRUE if the application has set the **m_enabled** member.

wxUpdateUIEvent::m_setText

bool m_setText

TRUE if the application has set the **m_text** member.

wxUpdateUIEvent::m_text

wxString m_text

Holds the text with which the the application wishes to update the UI element.

wxUpdateUIEvent::Check

void Check(**bool** *check*)

Check or uncheck the UI element.

wxUpdateUIEvent::Enable

void Enable(**bool** *enable*)

Enable or disable the UI element.

wxUpdateUIEvent::GetChecked

bool GetChecked() const

Returns TRUE if the UI element should be checked.

wxUpdateUIEvent::GetEnabled

bool GetEnabled() const

Returns TRUE if the UI element should be enabled.

wxUpdateUIEvent::GetSetChecked

bool GetSetChecked() const

Returns TRUE if the application has called **SetChecked**. For wxWindows internal use only.

wxUpdateUIEvent::GetSetEnabled

bool GetSetEnabled() const

Returns TRUE if the application has called **SetEnabled**. For wxWindows internal use only.

wxUpdateUIEvent::GetSetText

bool GetSetText() const

Returns TRUE if the application has called **SetText**. For wxWindows internal use only.

wxUpdateUIEvent::GetText

wxString GetText() const

Returns the text that should be set for the UI element.

wxUpdateUIEvent::SetText

void SetText(const wxString& *text*)

Sets the text for this UI element.

wxURL

Derived from

wxObject (p. 750)

Include files

<wx/url.h>

See also

wxSocketBase (p. 943), *wxProtocol* (p. 853)

Example

```
wxURL url("http://a.host/a.dir/a.file");
wxInputStream *in_stream;

in_stream = url.GetInputStream();
// Then, you can use all IO calls of in_stream (See wxStream)
```

wxURL::wxURL

wxURL(**const wxString&** *url*)

Constructs an URL object from the string.

Parameters

url
    Url string to parse.

wxURL::~wxURL

~wxURL()

Destroys the URL object.

wxURL::GetProtocolName

wxString GetProtocolName() const

Returns the name of the protocol which will be used to get the URL.

wxURL::GetProtocol

wxProtocol& GetProtocol()

Returns a reference to the protocol which will be used to get the URL.

wxURL::GetPath

wxString GetPath()

Returns the path of the file to fetch. This path was encoded in the URL.

wxURL::GetError

wxURLError GetError() **const**

Returns the last error. This error refers to the URL parsing or to the protocol. It can be one of these errors:

wxURL_NOERR	No error.
wxURL_SNTXERR	Syntax error in the URL string.
wxURL_NOPROTO	Found no protocol which can get this URL.
wxURL_NOHOST	An host name is required for this protocol.
wxURL_NOPATH	A path is required for this protocol.
wxURL_CONNERR	Connection error.
wxURL_PROTOERR	An error occurred during negotiation.

wxURL::GetInputStream

wxInputStream * GetInputStream()

Creates a new input stream on the the specified URL. You can use all but seek functionnality of wxStream. Seek isn't available on all stream. For example, http or ftp streams doesn't deal with it.

Return value

Returns the initialized stream. You will have to delete it yourself.

See also

wxInputStream (p. 595)

wxURL::SetDefaultProxy

static void SetDefaultProxy(**const wxString&** *url_proxy*)

Sets the default proxy server to use to get the URL. The string specifies the proxy like this: <hostname>:<port number>.

Parameters

url_proxy
Specifies the proxy to use

See also

wxURL::SetProxy (p. 1172)

wxURL::SetProxy

void SetProxy(**const wxString&** *url_proxy*)

Sets the proxy to use for this URL.

See also

wxURL::SetDefaultProxy (p. 1171)

wxURL::ConvertToValidURI

static wxString ConvertToValidURI(**const wxString&** *uri*)

It converts a non-standardized URI to a valid network URI. It encodes non standard characters.

wxValidator

wxValidator is the base class for a family of validator classes that mediate between a class of control, and application data.

A validator has three major roles:

1. to transfer data from a C++ variable or own storage to and from a control;
2. to validate data in a control, and show an appropriate error message;
3. to filter events (such as keystrokes), thereby changing the behaviour of the associated control.

Validators can be plugged into controls dynamically.

To specify a default, 'null' validator, use the symbol **wxDefaultValidator**.

For more information, please see *Validator overview* (p. 1382).

wxPython note: If you wish to create a validator class in wxPython you should derive the class from `wxPyValidator` in order to get Python-aware capabilities for the various virtual methods.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/validate.h>

See also

Validator overview (p. 1382), *wxTextValidator* (p. 1097), *wxGenericValidator* (p. 479),

wxValidator::wxValidator

wxValidator()

Constructor.

wxValidator::~wxValidator

~wxValidator()

Destructor.

wxValidator::Clone

virtual wxObject* Clone() **const**

All validator classes must implement the **Clone** function, which returns an identical copy of itself. This is because validators are passed to control constructors as references which must be copied. Unlike objects such as pens and brushes, it does not make sense to have a reference counting scheme to do this cloning, because all validators should have separate data.

This base function returns NULL.

wxValidator::GetWindow

wxWindow* GetWindow() **const**

Returns the window associated with the validator.

wxValidator::SetBellOnError

wxvalidatorsetbellonerror

void SetBellOnError(**bool** *doIt = TRUE*)

This functions switches on or turns off the error sound produced by the validators if an invalid key is pressed.

wxValidator::SetWindow

void SetWindow(**wxWindow*** *window*)

Associates a window with the validator.

wxValidator::TransferFromWindow

virtual bool TransferToWindow()

This overridable function is called when the value in the window must be transferred to the validator. Return FALSE if there is a problem.

wxValidator::TransferToWindow

virtual bool TransferToWindow()

This overridable function is called when the value associated with the validator must be transferred to the window. Return FALSE if there is a problem.

wxValidator::Validate

virtual bool Validate(**wxWindow*** *parent*)

This overridable function is called when the value in the associated window must be validated. Return FALSE if the value in the window is not valid; you may pop up an error dialog.

wxVariant

The **wxVariant** class represents a container for any type. A variant's value can be changed at run time, possibly to a different type of value.

As standard, wxVariant can store values of type bool, char, double, long, string, string list, time, date, void pointer, list of strings, and list of variants. However, an application can extend wxVariant's capabilities by deriving from the class *wxVariantData* (p. 1183) and using the wxVariantData form of the wxVariant constructor or assignment operator to assign this data to a variant. Actual values for user-defined types will need to be accessed via the wxVariantData object, unlike the case for basic data types where convenience functions such as GetLong can be used.

This class is useful for reducing the programming for certain tasks, such as an editor for different data types, or a remote procedure call protocol.

An optional name member is associated with a wxVariant. This might be used, for example, in CORBA or OLE automation classes, where named parameters are required.

wxVariant is similar to wxExpr and also to wxPropertyValue. However, wxExpr is efficiency-optimized for a restricted range of data types, whereas wxVariant is less efficient but more extensible. wxPropertyValue may be replaced by wxVariant eventually.

Derived from

wxObject (p. 750)

Include files

<wx/variant.h>

See also

wxVariantData (p. 1183)

wxVariant::wxVariant

 wxVariant()

Default constructor.

 wxVariant(**const wxVariant&** *variant*)

Copy constructor.

 wxVariant(**const char*** *value*, **const wxString&** *name = ""*)

 wxVariant(**const wxString&** *value*, **const wxString&** *name = ""*)

Construction from a string value.

  wxVariant(**char** *value*, **const wxString&** *name* = *""*)

Construction from a character value.

  wxVariant(**long** *value*, **const wxString&** *name* = *""*)

Construction from an integer value. You may need to cast to (long) to avoid confusion with other constructors (such as the bool constructor).

  wxVariant(**bool** *value*, **const wxString&** *name* = *""*)

Construction from a boolean value.

  wxVariant(**double** *value*, **const wxString&** *name* = *""*)

Construction from a double-precision floating point value.

  wxVariant(**const wxList&** *value*, **const wxString&** *name* = *""*)

Construction from a list of wxVariant objects. This constructor copies *value*, the application is still responsible for deleting *value* and its contents.

  wxVariant(**const wxStringList&** *value*, **const wxString&** *name* = *""*)

Construction from a list of strings. This constructor copies *value*, the application is still responsible for deleting *value* and its contents.

  wxVariant(**const wxTime&** *value*, **const wxString&** *name* = *""*)

Construction from a time.

  wxVariant(**const wxDate&** *value*, **const wxString&** *name* = *""*)

Construction from a date.

  wxVariant(**void*** *value*, **const wxString&** *name* = *""*)

Construction from a void pointer.

  wxVariant(**wxVariantData*** *data*, **const wxString&** *name* = *""*)

Construction from user-defined data. The variant holds on to the *data* pointer.

wxVariant::~wxVariant

  ~wxVariant()

Destructor.

wxVariant::Append

void Append(**const wxVariant&** *value*)

Appends a value to the list.

wxVariant::ClearList

void ClearList()

Deletes the contents of the list.

wxVariant::GetCount

int GetCount() **const**

Returns the number of elements in the list.

wxVariant::Delete

bool Delete(**int** *item*)

Deletes the zero-based *item* from the list.

wxVariant::GetBool

bool GetBool() **const**

Returns the boolean value.

wxVariant::GetChar

char GetChar() **const**

Returns the character value.

wxVariant::GetData

wxVariantData* GetData() **const**

Returns a pointer to the internal variant data.

wxVariant::GetDate

wxDate GetDate() **const**

Gets the date value.

wxVariant::GetDouble

double GetDouble() **const**

Returns the floating point value.

wxVariant::GetLong

long GetLong() **const**

Returns the integer value.

wxVariant::GetName

const wxString& GetName() **const**

Returns a constant reference to the variant name.

wxVariant::GetString

wxString GetString() **const**

Gets the string value.

wxVariant::GetTime

wxTime GetTime() **const**

Gets the time value.

wxVariant::GetType

wxString GetType() **const**

Returns the value type as a string. The built-in types are: bool, char, date, double, list, long, string, stringlist, time, void*.

If the variant is null, the value type returned is the string "null" (not the empty string).

wxVariant::GetVoidPtr

void* GetVoidPtr() **const**

Gets the void pointer value.

wxVariant::Insert

void Insert(**const wxVariant&** *value*)

Inserts a value at the front of the list.

wxVariant::IsNull

bool IsNull() **const**

Returns TRUE if there is no data associated with this variant, FALSE if there is data.

wxVariant::IsType

bool IsType(**const wxString&** *type*) **const**

Returns TRUE if *type* matches the type of the variant, FALSE otherwise.

wxVariant::MakeNull

void MakeNull()

Makes the variant null by deleting the internal data.

wxVariant::MakeString

wxString MakeString() **const**

Makes a string representation of the variant value (for any type).

wxVariant::Member

bool Member(**const wxVariant&** *value*) **const**

Returns TRUE if *value* matches an element in the list.

wxVariant::NullList

void NullList()

Makes an empty list. This differs from a null variant which has no data; a null list is of type list, but the number of elements in the list is zero.

wxVariant::SetData

void SetData(**wxVariantData*** *data*)

Sets the internal variant data, deleting the existing data if there is any.

wxVariant::operator =

void operator =(**const wxVariant&** *value*)

void operator =(**wxVariantData*** *value*)

void operator =(**const wxString&** *value*)

void operator =(**const char*** *value*)

void operator =(**char** *value*)

void operator =(**const long** *value*)

void operator =(**const bool** *value*)

void operator =(**const double** *value*)

void operator =(**const wxDate&** *value*)

void operator =(**const wxTime&** *value*)

void operator =(**void*** *value*)

void operator =(**const wxList&** *value*)

void operator =(**const wxStringList&** *value*)

Assignment operators.

wxVariant::operator ==

bool operator ==(**const wxVariant&** *value*)

bool operator ==(**const wxString&** *value*)

bool operator ==(**const char*** *value*)

bool operator ==(**char** *value*)

bool operator ==(**const long** *value*)

bool operator ==(**const bool** *value*)

bool operator ==(**const double** *value*)

bool operator ==(**const wxDate&** *value*)

bool operator ==(**const wxTime&** *value*)

bool operator ==(**void*** *value*)

bool operator ==(**const wxList&** *value*)

bool operator ==(**const wxStringList&** *value*)

Equality test operators.

wxVariant::operator !=

bool operator !=(**const wxVariant&** *value*)

bool operator !=(**const wxString&** *value*)

bool operator !=(**const char*** *value*)

bool operator !=(**char** *value*)

bool operator !=(**const long** *value*)

bool operator !=(**const bool** *value*)

bool operator !=(**const double** *value*)

bool operator !=(**const wxDate&** *value*)

bool operator !=(**const wxTime&** *value*)

bool operator !=(**void*** *value*)

bool operator !=(**const wxList&** *value*)

bool operator !=(**const wxStringList&** *value*)

Inequality test operators.

wxVariant::operator []

wxVariant operator [](**size_t** *idx*) **const**

Returns the value at *idx* (zero-based).

wxVariant& operator [](**size_t** *idx*)

Returns a reference to the value at *idx* (zero-based). This can be used to change the value at this index.

wxVariant::operator char

char operator char() **const**

Operator for implicit conversion to a char, using *wxVariant::GetChar* (p. 1177).

wxVariant::operator double

double operator double() **const**

Operator for implicit conversion to a double, using *wxVariant::GetDouble* (p. 1178).

long operator long() **const**

Operator for implicit conversion to a long, using *wxVariant::GetLong* (p. 1178).

wxVariant::operator wxDate

wxDate operator wxDate() **const**

Operator for implicit conversion to a wxDate, using *wxVariant::GetDate* (p. 1178).

wxVariant::operator wxString

wxString operator wxString() **const**

Operator for implicit conversion to a string, using *wxVariant::MakeString* (p. 1179).

wxVariant::operator wxTime

wxTime operator wxTime() **const**

Operator for implicit conversion to a wxTime, using *wxVariant::GetTime* (p. 1178).

wxVariant::operator void*

void* operator void*() **const**

Operator for implicit conversion to a pointer to a void, using *wxVariant::GetVoidPtr* (p. 1179).

wxVariantData

The **wxVariantData** is used to implement a new type for wxVariant. Derive from wxVariantData, and override the pure virtual functions.

Derived from

wxObject (p. 750)

Include files

<wx/variant.h>

See also

wxVariant (p. 1174)

wxVariantData::wxVariantData

wxVariantData()

Default constructor.

wxVariantData::Copy

void Copy(**wxVariantData&** *data*)

Copy the data from 'this' object to *data*.

wxVariantData::Eq

bool Eq(**wxVariantData&** *data*) **const**

Returns TRUE if this object is equal to *data*.

wxVariantData::GetType

wxString GetType() **const**

Returns the string type of the data.

wxVariantData::Read

bool Read(**ostream&** *stream*)

bool Read(**wxString&** *string*)

Reads the data from *stream* or *string*.

wxVariantData::Write

bool Write(**ostream&** *stream*) **const**

bool Write(**wxString&** *string*) **const**

Writes the data to *stream* or *string*.

wxView

The view class can be used to model the viewing and editing component of an application's file-based data. It is part of the document/view framework supported by wxWindows, and cooperates with the *wxDocument* (p. 353), *wxDocTemplate* (p. 348) and *wxDocManager* (p. 334) classes.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/docview.h>

See also

wxView overview (p. 1413), *wxDocument* (p. 353), *wxDocTemplate* (p. 348),
wxDocManager (p. 334)

wxView::m_viewDocument

wxDocument* m_viewDocument

The document associated with this view. There may be more than one view per
document, but there can never be more than one document for one view.

wxView::m_viewFrame

wxFrame* m_viewFrame

Frame associated with the view, if any.

wxView::m_viewTypeName

wxString m_viewTypeName

The view type name given to the wxDocTemplate constructor, copied to this variable
when the view is created. Not currently used by the framework.

wxView::wxView

wxView()

Constructor. Define your own default constructor to initialize application-specific data.

wxView::~wxView

~wxView()

Destructor. Removes itself from the document's list of views.

wxView::Activate

virtual void Activate(**bool** *activate*)

Call this from your view frame's OnActivate member to tell the framework which view is currently active. If your windowing system doesn't call OnActivate, you may need to call this function from OnMenuCommand or any place where you know the view must be active, and the framework will need to get the current view.

The prepackaged view frame wxDocChildFrame calls wxView::Activate from its OnActivate member and from its OnMenuCommand member.

This function calls wxView::OnActivateView.

wxView::Close

virtual bool Close(**bool** *deleteWindow = TRUE*)

Closes the view by calling OnClose. If *deleteWindow* is TRUE, this function should delete the window associated with the view.

wxView::GetDocument

wxDocument* GetDocument() **const**

Gets a pointer to the document associated with the view.

wxView::GetDocumentManager

wxDocumentManager* GetDocumentManager() **const**

Returns a pointer to the document manager instance associated with this view.

wxView::GetFrame

wxFrame * GetFrame()

Gets the frame associated with the view (if any).

wxView::GetViewName

wxString GetViewName() **const**

Gets the name associated with the view (passed to the wxDocTemplate constructor). Not currently used by the framework.

wxView::OnActivateView

virtual void OnActivateView(**bool** *activate*, **wxView** *activeView, **wxView** *deactiveView)

Called when a view is activated by means of wxView::Activate. The default implementation does nothing.

wxView::OnChangeFilename

virtual void OnChangeFilename()

Called when the filename has changed. The default implementation constructs a suitable title and sets the title of the view frame (if any).

wxView::OnClose

virtual bool OnClose(**bool** *deleteWindow*)

Implements closing behaviour. The default implementation calls wxDocument::Close to close the associated document. Does not delete the view. The application may wish to do some cleaning up operations in this function, *if* a call to wxDocument::Close succeeded. For example, if your application's all share the same window, you need to disassociate the window from the view and perhaps clear the window. If *deleteWindow* is TRUE, delete the frame associated with the view.

wxView::OnCreate

virtual bool OnCreate(**wxDocument*** *doc*, **long** *flags*)

Called just after view construction to give the view a chance to initialize itself based on the passed document and flags (unused). By default, simply returns TRUE. If the function returns FALSE, the view will be deleted.

The predefined document child frame, wxDocChildFrame, calls this function automatically.

wxView::OnCreatePrintout

virtual wxPrintout* OnCreatePrintout()

If the printing framework is enabled in the library, this function returns a *wxPrintout* (p. 811) object for the purposes of printing. It should create a new object everytime it is called; the framework will delete objects it creates.

By default, this function returns an instance of wxDocPrintout, which prints and previews one page by calling wxView::OnDraw.

Override to return an instance of a class other than wxDocPrintout.

wxView::OnUpdate

virtual void OnUpdate (**wxView*** *sender*, **wxObject*** *hint*)

Called when the view should be updated. *sender* is a pointer to the view that sent the update request, or NULL if no single view requested the update (for instance, when the document is opened). *hint* is as yet unused but may in future contain application-specific information for making updating more efficient.

wxView::SetDocument

void SetDocument(**wxDocument*** *doc*)

Associates the given document with the view. Normally called by the framework.

wxView::SetFrame

void SetFrame (**wxFrame*** *frame*)

Sets the frame associated with this view. The application should call this if possible, to tell the view about the frame.

wxView::SetViewName

void SetViewName (**const wxString&** *name*)

Sets the view type name. Should only be called by the framework.

wxWave

This class represents a short wave file, in Windows WAV format, that can be stored in memory and played. Currently this class is implemented on Windows and GTK (Linux) only.

Derived from

wxObject (p. 750)

Include files

<wx/wave.h>

wxWave::wxWave

wxWave()

Default constructor.

wxWave(**const wxString&** *fileName*, **bool** *isResource = FALSE*)

Constructs a wave object from a file or resource. Call *wxWave::IsOk* (p. 1190) to determine whether this succeeded.

Parameters

fileName
    The filename or Windows resource.

isResource
    TRUE if *fileName* is a resource, FALSE if it is a filename.

wxWave::~wxWave

~wxWave()

Destroys the wxWave object.

wxWave::Create

bool Create(**const wxString&** *fileName*, **bool** *isResource = FALSE*)

Constructs a wave object from a file or resource.

Parameters

fileName
    The filename or Windows resource.

isResource
    TRUE if *fileName* is a resource, FALSE if it is a filename.

Return value

TRUE if the call was successful, FALSE otherwise.

wxWave::IsOk

bool IsOk() **const**

Returns TRUE if the object contains a successfully loaded file or resource, FALSE otherwise.

wxWave::Play

bool Play(**bool** *async = TRUE*, **bool** *looped = FALSE*) **const**

Plays the wave file synchronously or asynchronously, looped or single-shot.

wxWindow

wxWindow is the base class for all windows. Any children of the window will be deleted automatically by the destructor before the window itself is deleted.

Please note that we documented a number of handler functions (OnChar(), OnMouse() etc.) in this help text. These must not be called by a user program and are documented only for illustration. On several platforms, only a few of these handlers are actually written (they are not always needed) and if you are uncertain on how to add a certain behaviour to a window class, intercept the respective event as usual and call *wxEvent::Skip* (p. 380) so that the native platform can implement its native behaviour or just ignore the event if nothing needs to be done.

Derived from

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/window.h>

Window styles

The following styles can apply to all windows, although they will not always make sense

for a particular window class or on all platforms.

wxSIMPLE_BORDER	Displays a thin border around the window. wxBORDER is the old name for this style.
wxDOUBLE_BORDER	Displays a double border. Windows only.
wxSUNKEN_BORDER	Displays a sunken border.
wxRAISED_BORDER	Displays a raised border. GTK only.
wxSTATIC_BORDER	Displays a border suitable for a static control. Windows only.
wxTRANSPARENT_WINDOW	The window is transparent, that is, it will not receive paint events. Windows only.
wxNO_3D	Prevents the children of this window taking on 3D styles, even though the application-wide policy is for 3D controls. Windows only.
wxTAB_TRAVERSAL	Use this to enable tab traversal for non-dialog windows.
wxWANTS_CHARS	Use this to indicate that the window wants to get all char events - even for keys like TAB or ENTER which are usually used for dialog navigation and which wouldn't be generated without this style
wxNO_FULL_REPAINT_ON_RESIZE	Disables repainting the window completely when its size is changed - you will have to repaint the new window area manually if you use this style. Currently only has an effect for Windows.
wxVSCROLL	Use this style to enable a vertical scrollbar. (Still used?)
wxHSCROLL	Use this style to enable a horizontal scrollbar. (Still used?)
wxCLIP_CHILDREN	Use this style to eliminate flicker caused by the background being repainted, then children being painted over them. Windows only.

See also *window styles overview* (p. 1379).

See also

Event handling overview (p. 1372)

wxWindow::wxWindow

wxWindow()

Default constructor.

wxWindow(**wxWindow*** *parent*, **wxWindowID** *id*, **const wxPoint&** *pos* = *wxDefaultPosition*, **const wxSize&** *size* = *wxDefaultSize*, **long** *style* = *0*, **const wxString&** *name* = *wxPanelNameStr*)

Constructs a window, which can be a child of a frame, dialog or any other non-control window.

Parameters

parent

Pointer to a parent window.

id

Window identifier. If -1, will automatically create an identifier.

pos

Window position. wxDefaultPosition is (-1, -1) which indicates that wxWindows should generate a default position for the window. If using the wxWindow class directly, supply an actual position.

size

Window size. wxDefaultSize is (-1, -1) which indicates that wxWindows should generate a default size for the window. If no suitable size can be found, the window will be sized to 20x20 pixels so that the window is visible but obviously not correctly sized.

style

Window style. For generic window styles, please see *wxWindow* (p. 1190).

name

Window name.

wxWindow::~wxWindow

 ~wxWindow()

Destructor. Deletes all subwindows, then deletes itself. Instead of using the **delete** operator explicitly, you should normally use *wxWindow::Destroy* (p. 1198) so that wxWindows can delete a window only when it is safe to do so, in idle time.

See also

Window deletion overview (p. 1379), *wxWindow::OnCloseWindow* (p. 1213), *wxWindow::Destroy* (p. 1198), *wxCloseEvent* (p. 125)

wxWindow::AddChild

virtual void AddChild(**wxWindow*** *child*)

Adds a child window. This is called automatically by window creation functions so should not be required by the application programmer.

Parameters

child
> Child window to add.

wxWindow::CaptureMouse

virtual void CaptureMouse()

Directs all mouse input to this window. Call *wxWindow::ReleaseMouse* (p. 1225) to release the capture.

See also

wxWindow::ReleaseMouse (p. 1225)

wxWindow::Center

void Center(**int** *direction*)

A synonym for *Centre* (p. 1193).

wxWindow::CenterOnParent

void CenterOnParent(**int** *direction*)

A synonym for *CentreOnParent* (p. 1194).

wxWindow::CenterOnScreen

void CenterOnScreen(**int** *direction*)

A synonym for *CentreOnScreen* (p. 1194).

wxWindow::Centre

void Centre(**int** *direction = wxBOTH*)

Centres the window.

Parameters

direction
> Specifies the direction for the centering. May be wxHORIZONTAL, wxVERTICAL or wxBOTH. It may also include wxCENTRE_ON_SCREEN flag if you want to center the window on the entire screen and not on its parent window.

The flag `wxCENTRE_FRAME` is obsolete and should not be used any longer (it has no effect).

Remarks

If the window is a top level one (i.e. doesn't have a parent), it will be centered relative to the screen anyhow.

See also

wxWindow::Center (p. 1193)

wxWindow::CentreOnParent

void CentreOnParent(**int** *direction = wxBOTH*)

Centres the window on its parent. This is a more readable synonym for *Centre* (p. 1193).

Parameters

direction
     Specifies the direction for the centering. May be `wxHORIZONTAL`, `wxVERTICAL` or `wxBOTH`.

Remarks

This methods provides for a way to center top level windows over their parents instead of the entire screen. If there is no parent or if the window is not a top level window, then behaviour is the same as *wxWindow::Centre* (p. 1193).

See also

wxWindow::CentreOnScreen (p. 1193)

wxWindow::CentreOnScreen

void CentreOnScreen(**int** *direction = wxBOTH*)

Centres the window on screen. This only works for top level windows - otherwise, the window will still be centered on its parent.

Parameters

direction
     Specifies the direction for the centering. May be `wxHORIZONTAL`, `wxVERTICAL` or `wxBOTH`.

See also

wxWindow::CentreOnParent (p. 1193)

wxWindow::Clear

void Clear()

Clears the window by filling it with the current background colour. Does not cause an erase background event to be generated.

wxWindow::ClientToScreen

virtual void ClientToScreen(**int*** *x*, **int*** *y*) **const**

virtual wxPoint ClientToScreen(**const wxPoint&** *pt*) **const**

Converts to screen coordinates from coordinates relative to this window.

x
> A pointer to a integer value for the x coordinate. Pass the client coordinate in, and a screen coordinate will be passed out.

y
> A pointer to a integer value for the y coordinate. Pass the client coordinate in, and a screen coordinate will be passed out.

pt
> The client position for the second form of the function.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **ClientToScreen(point)**   Accepts and returns a wxPoint
> **ClientToScreenXY(x, y)**   Returns a 2-tuple, (x, y)

wxWindow::Close

virtual bool Close(**bool** *force = FALSE*)

The purpose of this call is to provide a safer way of destroying a window than using the *delete* operator.

Parameters

force
> FALSE if the window's close handler should be able to veto the destruction of this

window, TRUE if it cannot.

Remarks

Close calls the *close handler* (p. 125) for the window, providing an opportunity for the window to choose whether to destroy the window.

The close handler should check whether the window is being deleted forcibly, using *wxCloseEvent::GetForce* (p. 126), in which case it should destroy the window using *wxWindow::Destroy* (p. 1198).

Applies to managed windows (wxFrame and wxDialog classes) only.

Note that calling Close does not guarantee that the window will be destroyed; but it provides a way to simulate a manual close of a window, which may or may not be implemented by destroying the window. The default implementation of wxDialog::OnCloseWindow does not necessarily delete the dialog, since it will simply simulate an wxID_CANCEL event which itself only hides the dialog.

To guarantee that the window will be destroyed, call *wxWindow::Destroy* (p. 1198) instead.

See also

Window deletion overview (p. 1379), *wxWindow::OnCloseWindow* (p. 1213), *wxWindow::Destroy* (p. 1198), *wxCloseEvent* (p. 125)

wxWindow::ConvertDialogToPixels

wxPoint ConvertDialogToPixels(**const wxPoint&** *pt*)

wxSize ConvertDialogToPixels(**const wxSize&** *sz*)

Converts a point or size from dialog units to pixels.

For the x dimension, the dialog units are multiplied by the average character width and then divided by 4.

For the y dimension, the dialog units are multiplied by the average character height and then divided by 8.

Remarks

Dialog units are used for maintaining a dialog's proportions even if the font changes. Dialogs created using Dialog Editor optionally use dialog units.

You can also use these functions programmatically. A convenience macro is defined:

```
#define wxDLG_UNIT(parent, pt) parent->ConvertDialogToPixels(pt)
```

See also

wxWindow::ConvertPixelsToDialog (p. 1197)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

ConvertDialogPointToPixels(point)	Accepts and returns a wxPoint
ConvertDialogSizeToPixels(size)	Accepts and returns a wxSize

Additionally, the following helper functions are defined:

wxDLG_PNT(win, point)	Converts a wxPoint from dialog units to pixels
wxDLG_SZE(win, size)	Converts a wxSize from dialog units to pixels

wxWindow::ConvertPixelsToDialog

wxPoint ConvertPixelsToDialog(**const wxPoint&** *pt*)

wxSize ConvertPixelsToDialog(**const wxSize&** *sz*)

Converts a point or size from pixels to dialog units.

For the x dimension, the pixels are multiplied by 4 and then divided by the average character width.

For the y dimension, the pixels are multipled by 8 and then divided by the average character height.

Remarks

Dialog units are used for maintaining a dialog's proportions even if the font changes. Dialogs created using Dialog Editor optionally use dialog units.

See also

wxWindow::ConvertDialogToPixels (p. 1196)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

ConvertDialogPointToPixels(point)	Accepts and returns a wxPoint
ConvertDialogSizeToPixels(size)	Accepts and returns a wxSize

wxWindow::Destroy

virtual bool Destroy()

Destroys the window safely. Use this function instead of the delete operator, since different window classes can be destroyed differently. Frames and dialogs are not destroyed immediately when this function is called - they are added to a list of windows to be deleted on idle time, when all the window's events have been processed. This prevents problems with events being sent to non-existant windows.

Return value

TRUE if the window has either been successfully deleted, or it has been added to the list of windows pending real deletion.

wxWindow::DestroyChildren

virtual void DestroyChildren()

Destroys all children of a window. Called automatically by the destructor.

wxWindow::DragAcceptFiles

virtual void DragAcceptFiles(**bool** *accept*)

Enables or disables elibility for drop file events (OnDropFiles).

Parameters

accept
    If TRUE, the window is eligible for drop file events. If FALSE, the window will not accept drop file events.

Remarks

Windows only.

See also

wxWindow::OnDropFiles (p. 1214)

wxWindow::Enable

virtual void Enable(**bool** *enable*)

Enable or disable the window for user input.

Parameters

enable
  If TRUE, enables the window for input. If FALSE, disables the window.

See also

wxWindow::IsEnabled (p. 1207)

wxWindow::FindFocus

static wxWindow* FindFocus()

Finds the window or control which currently has the keyboard focus.

Remarks

Note that this is a static function, so it can be called without needing a wxWindow pointer.

See also

wxWindow::SetFocus (p. 1231)

wxWindow::FindWindow

wxWindow* FindWindow(long *id*)

Find a child of this window, by identifier.

wxWindow* FindWindow(const wxString& *name*)

Find a child of this window, by name.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **FindWindowById(id)**   Accepts an integer
> **FindWindowByName(name)**   Accepts a string

wxWindow::Fit

virtual void Fit()

Sizes the window so that it fits around its subwindows. This function won't do anything if

there are no subwindows.

wxWindow::GetBackgroundColour

virtual wxColour GetBackgroundColour() const

Returns the background colour of the window.

See also

wxWindow::SetBackgroundColour (p. 1227), *wxWindow::SetForegroundColour* (p. 1231), *wxWindow::GetForegroundColour* (p. 1202), *wxWindow::OnEraseBackground* (p. 1215)

wxWindow::GetBestSize

virtual wxSize GetBestSize() const

This functions returns the best acceptable minimal size for the window. For example, for a static control, it will be the minimal size such that the control label is not truncated. For windows containing subwindows (typically *wxPanel* (p. 769)), the size returned by this function will be the same as the size the window would have had after calling *Fit* (p. 1199).

wxWindow::GetCaret

wxCaret * GetCaret() const

Returns the *caret* (p. 105) associated with the window.

wxWindow::GetCharHeight

virtual int GetCharHeight() const

Returns the character height for this window.

wxWindow::GetCharWidth

virtual int GetCharWidth() const

Returns the average character width for this window.

wxWindow::GetChildren

wxList& GetChildren()

Returns a reference to the list of the window's children.

wxWindow::GetClientSize

virtual void GetClientSize(**int*** *width*, **int*** *height*) **const**

virtual wxSize GetClientSize() **const**

This gets the size of the window 'client area' in pixels. The client area is the area which may be drawn on by the programmer, excluding title bar, border etc.

Parameters

width
    Receives the client width in pixels.

height
    Receives the client height in pixels.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

GetClientSizeTuple()	Returns a 2-tuple of (width, height)
GetClientSize()	Returns a wxSize object

wxWindow::GetConstraints

wxLayoutConstraints* GetConstraints() **const**

Returns a pointer to the window's layout constraints, or NULL if there are none.

wxWindow::GetDropTarget

wxDropTarget* GetDropTarget() **const**

Returns the associated drop target, which may be NULL.

See also

wxWindow::SetDropTarget (p. 1229), *Drag and drop overview* (p. 1430)

wxWindow::GetEventHandler

wxEvtHandler* GetEventHandler() const

Returns the event handler for this window. By default, the window is its own event handler.

See also

wxWindow::SetEventHandler (p. 1230), *wxWindow::PushEventHandler* (p. 1224), *wxWindow::PopEventHandler* (p. 1224), *wxEvtHandler::ProcessEvent* (p. 384), *wxEvtHandler* (p. 380)

wxWindow::GetExtraStyle

long GetExtraStyle() const

Returns the extra style bits for the window.

wxWindow::GetFont

wxFont& GetFont() const

Returns a reference to the font for this window.

See also

wxWindow::SetFont (p. 1231)

wxWindow::GetForegroundColour

virtual wxColour GetForegroundColour()

Returns the foreground colour of the window.

Remarks

The interpretation of foreground colour is open to interpretation according to the window class; it may be the text colour or other colour, or it may not be used at all.

See also

wxWindow::SetForegroundColour (p. 1231), *wxWindow::SetBackgroundColour* (p. 1227), *wxWindow::GetBackgroundColour* (p. 1200)

wxWindow::GetGrandParent

wxWindow* GetGrandParent() const

Returns the grandparent of a window, or NULL if there isn't one.

wxWindow::GetHandle

void* GetHandle() const

Returns the platform-specific handle of the physical window. Cast it to an appropriate handle, such as **HWND** for Windows, **Widget** for Motif or **GtkWidget** for GTK.

wxPython note: This method will return an integer in wxPython.

wxWindow::GetId

int GetId() const

Returns the identifier of the window.

Remarks

Each window has an integer identifier. If the application has not provided one (or the default Id -1) an unique identifier with a negative value will be generated.

See also

wxWindow::SetId (p. 1232), *Window identifiers* (p. 1376)

wxWindow::GetLabel

virtual wxString GetLabel() const

Generic way of getting a label from any window, for identification purposes.

Remarks

The interpretation of this function differs from class to class. For frames and dialogs, the value returned is the title. For buttons or static text controls, it is the button text. This function can be useful for meta-programs (such as testing tools or special-needs access programs) which need to identify windows by name.

wxWindow::GetName

virtual wxString GetName() const

Returns the window's name.

Remarks

This name is not guaranteed to be unique; it is up to the programmer to supply an appropriate name in the window constructor or via *wxWindow::SetName* (p. 1232).

See also

wxWindow::SetName (p. 1232)

wxWindow::GetParent

virtual wxWindow* GetParent() **const**

Returns the parent of the window, or NULL if there is no parent.

wxWindow::GetPosition

virtual void GetPosition(**int*** *x*, **int*** *y*) **const**

wxPoint GetPosition() **const**

This gets the position of the window in pixels, relative to the parent window or if no parent, relative to the whole display.

Parameters

x
> Receives the x position of the window.

y
> Receives the y position of the window.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

GetPosition()	Returns a wxPoint
GetPositionTuple()	Returns a tuple (x, y)

wxWindow::GetRect

virtual wxRect GetRect() **const**

Returns the size and position of the window as a *wxRect* (p. 873) object.

wxWindow::GetScrollThumb

virtual int GetScrollThumb(**int** *orientation*)

Returns the built-in scrollbar thumb size.

See also

wxWindow::SetScrollbar (p. 1232)

wxWindow::GetScrollPos

virtual int GetScrollPos(**int** *orientation*)

Returns the built-in scrollbar position.

See also

See *wxWindow::SetScrollbar* (p. 1232)

wxWindow::GetScrollRange

virtual int GetScrollRange(**int** *orientation*)

Returns the built-in scrollbar range.

See also

wxWindow::SetScrollbar (p. 1232)

wxWindow::GetSize

virtual void GetSize(**int*** *width*, **int*** *height*) **const**

virtual wxSize GetSize() **const**

This gets the size of the entire window in pixels.

Parameters

width
    Receives the window width.

height
    Receives the window height.

wxPython note: In place of a single overloaded method name, wxPython implements

the following methods:

GetSize()	Returns a wxSize
GetSizeTuple()	Returns a 2-tuple (width, height)

wxWindow::GetTextExtent

virtual void GetTextExtent(**const wxString&** *string*, **int*** *x*, **int*** *y*, **int*** *descent = NULL*, **int*** *externalLeading = NULL*, **const wxFont*** *font = NULL*, **bool** *use16 = FALSE*) **const**

Gets the dimensions of the string as it would be drawn on the window with the currently selected font.

Parameters

string
>String whose extent is to be measured.

x
>Return value for width.

y
>Return value for height.

descent
>Return value for descent (optional).

externalLeading
>Return value for external leading (optional).

font
>Font to use instead of the current window font (optional).

use16
>If TRUE, *string* contains 16-bit characters. The default is FALSE.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

GetTextExtent(string)	Returns a 2-tuple, (width, height)
GetFullTextExtent(string, font=NULL)	Returns a 4-tuple, (width, height, descent, externalLeading)

wxWindow::GetTitle

virtual wxString GetTitle()

Gets the window's title. Applicable only to frames and dialogs.

See also

wxWindow::SetTitle (p. 1236)

wxWindow::GetUpdateRegion

virtual wxRegion GetUpdateRegion() const

Returns the region specifying which parts of the window have been damaged. Should only be called within an *OnPaint* (p. 1219) event handler.

See also

wxRegion (p. 890), *wxRegionIterator* (p. 894), *wxWindow::OnPaint* (p. 1219)

wxWindow::GetValidator

wxValidator* GetValidator() const

Returns a pointer to the current validator for the window, or NULL if there is none.

wxWindow::GetWindowStyleFlag

long GetWindowStyleFlag() const

Gets the window style that was passed to the constructor or **Create** method. **GetWindowStyle()** is another name for the same function.

wxWindow::InitDialog

void InitDialog()

Sends an *wxWindow::OnInitDialog* (p. 1217) event, which in turn transfers data to the dialog via validators.

See also

wxWindow::OnInitDialog (p. 1217)

wxWindow::IsEnabled

virtual bool IsEnabled() const

Returns TRUE if the window is enabled for input, FALSE otherwise.

See also

wxWindow::Enable (p. 1198)

wxWindow:IsExposed

bool IsExposed(int *x*, int *y*) **const**

bool IsExposed(**wxPoint** &*pt*) **const**

bool IsExposed(int *x*, int *y*, int *w*, int *h*) **const**

bool IsExposed(**wxRect** &*rect*) **const**

Returns TRUE if the given point or rectange area has been exposed since the last repaint. Call this in an paint event handler to optimize redrawing by only redrawing those areas, which have been exposed.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **IsExposed(x,y, w=0,h=0**
> **IsExposedPoint(pt)**
> **IsExposedRect(rect)**

wxWindow::IsRetained

virtual bool IsRetained() **const**

Returns TRUE if the window is retained, FALSE otherwise.

Remarks

Retained windows are only available on X platforms.

wxWindow::IsShown

virtual bool IsShown() **const**

Returns TRUE if the window is shown, FALSE if it has been hidden.

wxWindow::IsTopLevel

bool IsTopLevel() const

Returns TRUE if the given window is a top-level one. Currently all frames and dialogs are considered to be top-level windows (even if they have a parent window).

wxWindow::Layout

void Layout()

Invokes the constraint-based layout algorithm or the sizer-based algorithm for this window.

See *wxWindow::SetAutoLayout* (p. 1227) on when this function gets called automatically using auto layout.

wxWindow::LoadFromResource

virtual bool LoadFromResource(wxWindow* *parent*, const wxString& *resourceName*, const wxResourceTable* *resourceTable* = *NULL*)

Loads a panel or dialog from a resource file.

Parameters

parent
Parent window.

resourceName
The name of the resource to load.

resourceTable
The resource table to load it from. If this is NULL, the default resource table will be used.

Return value

TRUE if the operation succeeded, otherwise FALSE.

wxWindow::Lower

void Lower()

Lowers the window to the bottom of the window hierarchy if it is a managed window (dialog or frame).

wxWindow::MakeModal

virtual void MakeModal(**bool** *flag*)

Disables all other windows in the application so that the user can only interact with this window. (This function is not implemented anywhere).

Parameters

flag
If TRUE, this call disables all other windows in the application so that the user can only interact with this window. If FALSE, the effect is reversed.

wxWindow::Move

void Move(**int** *x*, **int** *y*)

void Move(**const wxPoint&** *pt*)

Moves the window to the given position.

Parameters

x
Required x position.

y
Required y position.

pt
wxPoint (p. 790) object representing the position.

Remarks

Implementations of SetSize can also implicitly implement the wxWindow::Move function, which is defined in the base wxWindow class as the call:

```
SetSize(x, y, -1, -1, wxSIZE_USE_EXISTING);
```

See also

wxWindow::SetSize (p. 1234)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

Move(point)	Accepts a wxPoint
MoveXY(x, y)	Accepts a pair of integers

wxWindow::OnActivate

void OnActivate(**wxActivateEvent&** *event*)

Called when a window is activated or deactivated.

Parameters

event
    Object containing activation information.

Remarks

If the window is being activated, *wxActivateEvent::GetActive* (p. 21) returns TRUE, otherwise it returns FALSE (it is being deactivated).

See also

wxActivateEvent (p. 20), *Event handling overview* (p. 1372)

wxWindow::OnChar

void OnChar(**wxKeyEvent&** *event*)

Called when the user has pressed a key that is not a modifier (SHIFT, CONTROL or ALT).

Parameters

event
    Object containing keypress information. See *wxKeyEvent* (p. 610) for details about this class.

Remarks

This member function is called in response to a keypress. To intercept this event, use the EVT_CHAR macro in an event table definition. Your **OnChar** handler may call this default function to achieve default keypress functionality.

Note that the ASCII values do not have explicit key codes: they are passed as ASCII values.

Note that not all keypresses can be intercepted this way. If you wish to intercept modifier keypresses, then you will need to use *wxWindow::OnKeyDown* (p. 1215) or *wxWindow::OnKeyUp* (p. 1216).

Most, but not all, windows allow keypresses to be intercepted.

wxWindow::OnCharHook

void OnCharHook(wxKeyEvent& *event*)

This member is called to allow the window to intercept keyboard events before they are processed by child windows.

Parameters

event
    Object containing keypress information. See *wxKeyEvent* (p. 610) for details about this class.

Remarks

This member function is called in response to a keypress, if the window is active. To intercept this event, use the EVT_CHAR_HOOK macro in an event table definition. If you do not process a particular keypress, call *wxEvent::Skip* (p. 380) to allow default processing.

An example of using this function is in the implementation of escape-character processing for wxDialog, where pressing ESC dismisses the dialog by **OnCharHook** 'forging' a cancel button press event.

Note that the ASCII values do not have explicit key codes: they are passed as ASCII values.

This function is only relevant to top-level windows (frames and dialogs), and under Windows only. Under GTK the normal EVT_CHAR_ event has the functionality, i.e. you can intercepts it and if you don't call *wxEvent::Skip* (p. 380)the window won't get the event.

See also

wxKeyEvent (p. 610), *wxWindow::OnCharHook* (p. 1212), *wxApp::OnCharHook* (p. 26), *Event handling overview*(p. 1372)

wxWindow::OnCommand

virtual void OnCommand(wxEvtHandler& *object*, wxCommandEvent& *event*)

This virtual member function is called if the control does not handle the command event.

Parameters

object
> Object receiving the command event.

event
> Command event

Remarks

This virtual function is provided mainly for backward compatibility. You can also intercept commands from child controls by using an event table, with identifiers or identifier ranges to identify the control(s) in question.

See also

wxCommandEvent (p. 153), *Event handling overview* (p. 1372)

wxWindow::OnClose

virtual bool OnClose()

Called when the user has tried to close a a frame or dialog box using the window manager (X) or system menu (Windows).

Note: This is an obsolete function. It is superceded by the *wxWindow::OnCloseWindow* (p. 1213) event handler.

Return value

If TRUE is returned by OnClose, the window will be deleted by the system, otherwise the attempt will be ignored. Do not delete the window from within this handler, although you may delete other windows.

See also

Window deletion overview (p. 1379), *wxWindow::Close* (p. 1195), *wxWindow::OnCloseWindow* (p. 1213), *wxCloseEvent* (p. 125)

wxWindow::OnCloseWindow

void OnCloseWindow(**wxCloseEvent&** *event*)

This is an event handler function called when the user has tried to close a a frame or dialog box using the window manager (X) or system menu (Windows). It is called via the *wxWindow::Close* (p. 1195) function, so that the application can also invoke the handler programmatically.

Use the EVT_CLOSE event table macro to handle close events.

You should check whether the application is forcing the deletion of the window using *wxCloseEvent::GetForce* (p. 126). If this is TRUE, destroy the window using *wxWindow::Destroy* (p. 1198). If not, it is up to you whether you respond by destroying the window.

(Note: GetForce is now superceded by CanVeto. So to test whether forced destruction of the window is required, test for the negative of CanVeto. If CanVeto returns FALSE, it is not possible to skip window deletion.)

If you don't destroy the window, you should call *wxCloseEvent::Veto* (p. 126) to let the calling code know that you did not destroy the window. This allows the *wxWindow::Close* (p. 1195) function to return TRUE or FALSE depending on whether the close instruction was honoured or not.

Remarks

The *wxWindow::OnClose* (p. 1213) virtual function remains for backward compatibility with earlier versions of wxWindows. The default **OnCloseWindow** handler for wxFrame and wxDialog will call **OnClose**, destroying the window if it returns TRUE or if the close is being forced.

See also

Window deletion overview (p. 1379), *wxWindow::Close* (p. 1195), *wxWindow::OnClose* (p. 1213), *wxWindow::Destroy* (p. 1198), *wxCloseEvent* (p. 125), *wxApp::OnQueryEndSession* (p. 28), *wxApp::OnEndSession* (p. 27)

wxWindow::OnDropFiles

void OnDropFiles(**wxDropFilesEvent&** *event*)

Called when files have been dragged from the file manager to the window.

Parameters

event
    Drop files event. For more information, see *wxDropFilesEvent* (p. 366).

Remarks

The window must have previously been enabled for dropping by calling *wxWindow::DragAcceptFiles* (p. 1198).

This event is only generated under Windows.

To intercept this event, use the EVT_DROP_FILES macro in an event table definition.

See also

wxDropFilesEvent (p. 366), *wxWindow::DragAcceptFiles* (p. 1198), *Event handling overview* (p. 1372)

wxWindow::OnEraseBackground

void OnEraseBackground(**wxEraseEvent&** *event*)

Called when the background of the window needs to be erased.

Parameters

event
> Erase background event. For more information, see *wxEraseEvent* (p. 376).

Remarks

Under non-Windows platforms, this event is simulated (simply generated just before the paint event) and may cause flicker. It is therefore recommended that you set the text background colour explicitly in order to prevent flicker. The default background colour under GTK is grey.

To intercept this event, use the EVT_ERASE_BACKGROUND macro in an event table definition.

See also

wxEraseEvent (p. 376), *Event handling overview* (p. 1372)

wxWindow::OnKeyDown

void OnKeyDown(**wxKeyEvent&** *event*)

Called when the user has pressed a key, before it is translated into an ASCII value using other modifier keys that might be pressed at the same time.

Parameters

event
> Object containing keypress information. See *wxKeyEvent* (p. 610) for details about this class.

Remarks

This member function is called in response to a key down event. To intercept this event, use the EVT_KEY_DOWN macro in an event table definition. Your **OnKeyDown** handler may call this default function to achieve default keypress functionality.

Note that not all keypresses can be intercepted this way. If you wish to intercept special keys, such as shift, control, and function keys, then you will need to use *wxWindow::OnKeyDown* (p. 1215) or *wxWindow::OnKeyUp* (p. 1216).

Most, but not all, windows allow keypresses to be intercepted.

See also

wxWindow::OnChar (p. 1211), *wxWindow::OnKeyUp* (p. 1216), *wxKeyEvent* (p. 610), *wxWindow::OnCharHook* (p. 1212), *Event handling overview* (p. 1372)

wxWindow::OnKeyUp

void OnKeyUp(**wxKeyEvent&** *event*)

Called when the user has released a key.

Parameters

event
　　Object containing keypress information. See *wxKeyEvent* (p. 610) for details about this class.

Remarks

This member function is called in response to a key up event. To intercept this event, use the EVT_KEY_UP macro in an event table definition. Your **OnKeyUp** handler may call this default function to achieve default keypress functionality.

Note that not all keypresses can be intercepted this way. If you wish to intercept special keys, such as shift, control, and function keys, then you will need to use *wxWindow::OnKeyDown* (p. 1215) or *wxWindow::OnKeyUp* (p. 1216).

Most, but not all, windows allow key up events to be intercepted.

See also

wxWindow::OnChar (p. 1211), *wxWindow::OnKeyDown* (p. 1215), *wxKeyEvent* (p. 610), *wxWindow::OnCharHook* (p. 1212), *Event handling overview* (p. 1372)

wxWindow::OnKillFocus

void OnKillFocus(**wxFocusEvent&** *event*)

Called when a window's focus is being killed.

Parameters

event
>   The focus event. For more information, see *wxFocusEvent* (p. 436).

Remarks

To intercept this event, use the macro EVT_KILL_FOCUS in an event table definition.

Most, but not all, windows respond to this event.

See also

wxFocusEvent (p. 436), *wxWindow::OnSetFocus* (p. 1221), *Event handling overview* (p. 1372)

wxWindow::OnIdle

void OnIdle (**wxIdleEvent&** *event*)

Provide this member function for any processing which needs to be done when the application is idle.

See also

wxApp::OnIdle (p. 27), *wxIdleEvent* (p. 560)

wxWindow::OnInitDialog

void OnInitDialog (**wxInitDialogEvent&** *event*)

Default handler for the wxEVT_INIT_DIALOG event. Calls *wxWindow::TransferDataToWindow* (p. 1238).

Parameters

event
>   Dialog initialisation event.

Remarks

Gives the window the default behaviour of transferring data to child controls via the validator that each control has.

See also

wxValidator (p. 1172), *wxWindow::TransferDataToWindow* (p. 1238)

wxWindow::OnMenuCommand

void OnMenuCommand(**wxCommandEvent&** *event*)

Called when a menu command is received from a menu bar.

Parameters

event
    The menu command event. For more information, see *wxCommandEvent* (p. 153).

Remarks

A function with this name doesn't actually exist; you can choose any member function to receive menu command events, using the EVT_COMMAND macro for individual commands or EVT_COMMAND_RANGE for a range of commands.

See also

wxCommandEvent (p. 153), *wxWindow::OnMenuHighlight* (p. 1218), *Event handling overview* (p. 1372)

wxWindow::OnMenuHighlight

void OnMenuHighlight(**wxMenuEvent&** *event*)

Called when a menu select is received from a menu bar: that is, the mouse cursor is over a menu item, but the left mouse button has not been pressed.

Parameters

event
    The menu highlight event. For more information, see *wxMenuEvent* (p. 711).

Remarks

You can choose any member function to receive menu select events, using the EVT_MENU_HIGHLIGHT macro for individual menu items or EVT_MENU_HIGHLIGHT_ALL macro for all menu items.

The default implementation for *wxFrame::OnMenuHighlight* (p. 463) displays help text in the first field of the status bar.

This function was known as **OnMenuSelect** in earlier versions of wxWindows, but this was confusing since a selection is normally a left-click action.

See also

wxMenuEvent (p. 711), *wxWindow::OnMenuCommand* (p. 1217), *Event handling*

overview (p. 1372)

wxWindow::OnMouseEvent

void OnMouseEvent(**wxMouseEvent&** *event*)

Called when the user has initiated an event with the mouse.

Parameters

event
  The mouse event. See *wxMouseEvent* (p. 725) for more details.

Remarks

Most, but not all, windows respond to this event.

To intercept this event, use the EVT_MOUSE_EVENTS macro in an event table definition, or individual mouse event macros such as EVT_LEFT_DOWN.

See also

wxMouseEvent (p. 725), *Event handling overview* (p. 1372)

wxWindow::OnMove

void OnMove(**wxMoveEvent&** *event*)

Called when a window is moved.

Parameters

event
  The move event. For more information, see *wxMoveEvent* (p. 733).

Remarks

Use the EVT_MOVE macro to intercept move events.

Remarks

Not currently implemented.

See also

wxMoveEvent (p. 733), *wxFrame::OnSize* (p. 463), *Event handling overview* (p. 1372)

wxWindow::OnPaint

void OnPaint(**wxPaintEvent&** *event*)

Sent to the event handler when the window must be refreshed.

Parameters

event
>   Paint event. For more information, see *wxPaintEvent* (p. 764).

Remarks

Use the EVT_PAINT macro in an event table definition to intercept paint events.

Note that In a paint event handler, the application must *always* create a *wxPaintDC* (p. 763) object, even if you do not use it. Otherwise, under MS Windows, refreshing for this and other windows will go wrong.

For example:

```
void MyWindow::OnPaint(wxPaintEvent\& event)
{
    wxPaintDC dc(this);

    DrawMyDocument(dc);
}
```

You can optimize painting by retrieving the rectangles that have been damaged and only repainting these. The rectangles are in terms of the client area, and are unscrolled, so you will need to do some calculations using the current view position to obtain logical, scrolled units.

Here is an example of using the *wxRegionIterator* (p. 894) class:

```
// Called when window needs to be repainted.
void MyWindow::OnPaint(wxPaintEvent\& event)
{
  wxPaintDC dc(this);

  // Find Out where the window is scrolled to
  int vbX,vbY;                     // Top left corner of client
  GetViewStart(&vbX,&vbY);

  int vX,vY,vW,vH;                 // Dimensions of client area in
pixels
  wxRegionIterator upd(GetUpdateRegion()); // get the update rect list

  while (upd)
  {
    vX = upd.GetX();
```

```
      vY = upd.GetY();
      vW = upd.GetW();
      vH = upd.GetH();

      // Alternatively we can do this:
      // wxRect rect;
      // upd.GetRect(&rect);

      // Repaint this rectangle
      ...some code...

      upd ++ ;
   }
}
```

See also

wxPaintEvent (p. 764), *wxPaintDC* (p. 763), *Event handling overview* (p. 1372)

wxWindow::OnScroll

void OnScroll(wxScrollWinEvent& *event*)

Called when a scroll window event is received from one of the window's built-in scrollbars.

Parameters

event
> Command event. Retrieve the new scroll position by calling
> *wxScrollEvent::GetPosition* (p. 916), and the scrollbar orientation by calling
> *wxScrollEvent::GetOrientation* (p. 916).

Remarks

Note that it is not possible to distinguish between horizontal and vertical scrollbars until the function is executing (you can't have one function for vertical, another for horizontal events).

See also

wxScrollWinEvent (p. 912), *Event handling overview* (p. 1372)

wxWindow::OnSetFocus

void OnSetFocus(wxFocusEvent& *event*)

Called when a window's focus is being set.

Parameters

event
> The focus event. For more information, see *wxFocusEvent* (p. 436).

Remarks

To intercept this event, use the macro EVT_SET_FOCUS in an event table definition.

Most, but not all, windows respond to this event.

See also

wxFocusEvent (p. 436), *wxWindow::OnKillFocus* (p. 1216), *Event handling overview* (p. 1372)

wxWindow::OnSize

void OnSize(**wxSizeEvent&** *event*)

Called when the window has been resized.

Parameters

event
> Size event. For more information, see *wxSizeEvent* (p. 928).

Remarks

You may wish to use this for frames to resize their child windows as appropriate.

Note that the size passed is of the whole window: call *wxWindow::GetClientSize* (p. 1201) for the area which may be used by the application.

When a window is resized, usually only a small part of the window is damaged and you may only need to repaint that area. However, if your drawing depends on the size of the window, you may need to clear the DC explicitly and repaint the whole window. In which case, you may need to call *wxWindow::Refresh* (p. 1225) to invalidate the entire window.

See also

wxSizeEvent (p. 928), *Event handling overview* (p. 1372)

wxWindow::OnSysColourChanged

void OnSysColourChanged(**wxOnSysColourChangedEvent&** *event*)

Called when the user has changed the system colours. Windows only.

Parameters

event

System colour change event. For more information, see
wxSysColourChangedEvent (p. 1039).

See also

wxSysColourChangedEvent (p. 1039), *Event handling overview* (p. 1372)

wxWindow::PopEventHandler

wxEvtHandler* PopEventHandler(**bool** *deleteHandler = FALSE*) **const**

Removes and returns the top-most event handler on the event handler stack.

Parameters

deleteHandler

If this is TRUE, the handler will be deleted after it is removed. The default value is
FALSE.

See also

wxWindow::SetEventHandler (p. 1230), *wxWindow::GetEventHandler* (p. 1201),
wxWindow::PushEventHandler (p. 1224), *wxEvtHandler::ProcessEvent* (p. 384),
wxEvtHandler (p. 380)

wxWindow::PopupMenu

bool PopupMenu(**wxMenu*** *menu*, **const wxPoint&** *pos*)

bool PopupMenu(**wxMenu*** *menu*, **int** *x*, **int** *y*)

Pops up the given menu at the specified coordinates, relative to this window, and returns
control when the user has dismissed the menu. If a menu item is selected, the
corresponding menu event is generated and will be processed as usually.

Parameters

menu

Menu to pop up.

pos

The position where the menu will appear.

x

Required x position for the menu to appear.

y
> Required y position for the menu to appear.

See also

wxMenu (p. 687)

Remarks

Just before the menu is popped up, *wxMenu::UpdateUI* (p. 697) is called to ensure that the menu items are in the correct state. The menu does not get deleted by the window.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **PopupMenu(menu, point)** Specifies position with a wxPoint
> **PopupMenuXY(menu, x, y)** Specifies position with two integers (x, y)

wxWindow::PushEventHandler

void PushEventHandler(**wxEvtHandler*** *handler*)

Pushes this event handler onto the event stack for the window.

Parameters

handler
> Specifies the handler to be pushed.

Remarks

An event handler is an object that is capable of processing the events sent to a window. By default, the window is its own event handler, but an application may wish to substitute another, for example to allow central implementation of event-handling for a variety of different window classes.

wxWindow::PushEventHandler (p. 1224) allows an application to set up a chain of event handlers, where an event not handled by one event handler is handed to the next one in the chain. Use *wxWindow::PopEventHandler* (p. 1223) to remove the event handler.

See also

wxWindow::SetEventHandler (p. 1230), *wxWindow::GetEventHandler* (p. 1201), *wxWindow::PopEventHandler* (p. 1224), *wxEvtHandler::ProcessEvent* (p. 384), *wxEvtHandler* (p. 380)

wxWindow::Raise

void Raise()

Raises the window to the top of the window hierarchy if it is a managed window (dialog or frame).

wxWindow::Refresh

virtual void Refresh(**bool** *eraseBackground = TRUE*, **const wxRect*** *rect = NULL*)

Causes a message or event to be generated to repaint the window.

Parameters

eraseBackground
    If TRUE, the background will be erased.

rect
    If non-NULL, only the given rectangle will be treated as damaged.

wxWindow::ReleaseMouse

virtual void ReleaseMouse()

Releases mouse input captured with *wxWindow::CaptureMouse* (p. 1193).

See also

wxWindow::CaptureMouse (p. 1193)

wxWindow::RemoveChild

virtual void RemoveChild(**wxWindow*** *child*)

Removes a child window. This is called automatically by window deletion functions so should not be required by the application programmer.

Parameters

child
    Child window to remove.

wxWindow::Reparent

virtual bool Reparent(**wxWindow*** *newParent*)

Reparents the window, i.e the window will be removed from its current parent window (e.g. a non-standard toolbar in a wxFrame) and then re-inserted into another. Available on Windows and GTK.

Parameters

newParent
New parent.

wxWindow::ScreenToClient

virtual void ScreenToClient(**int*** *x*, **int*** *y*) **const**

virtual wxPoint ScreenToClient(**const wxPoint&** *pt*) **const**

Converts from screen to client window coordinates.

Parameters

x
Stores the screen x coordinate and receives the client x coordinate.

y
Stores the screen x coordinate and receives the client x coordinate.

pt
The screen position for the second form of the function.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

ScreenToClient(point)	Accepts and returns a wxPoint
ScreenToClientXY(x, y)	Returns a 2-tuple, (x, y)

wxWindow::ScrollWindow

virtual void ScrollWindow(**int** *dx*, **int** *dy*, **const wxRect*** *rect = NULL*)

Physically scrolls the pixels in the window and move child windows accordingly.

Parameters

dx
Amount to scroll horizontally.

dy

Amount to scroll vertically.

rect

Rectangle to invalidate. If this is NULL, the whole window is invalidated. If you pass a rectangle corresponding to the area of the window exposed by the scroll, your painting handler can optimize painting by checking for the invalidated region. This parameter is ignored under GTK.

Remarks

Use this function to optimise your scrolling implementations, to minimise the area that must be redrawn. Note that it is rarely required to call this function from a user program.

wxWindow::SetAcceleratorTable

virtual void SetAcceleratorTable(**const wxAcceleratorTable&** *accel*)

Sets the accelerator table for this window. See *wxAcceleratorTable* (p. 17).

wxWindow::SetAutoLayout

void SetAutoLayout(**bool** *autoLayout*)

Determines whether the *wxWindow::Layout* (p. 1209) function will be called automatically when the window is resized. Use in connection with *wxWindow::SetSizer* (p. 1236) and *wxWindow::SetConstraints* (p. 1229) for laying out subwindows.

Parameters

autoLayout

Set this to TRUE if you wish the Layout function to be called from within wxWindow::OnSize functions.

See also

wxWindow::SetConstraints (p. 1229)

wxWindow::SetBackgroundColour

virtual void SetBackgroundColour(**const wxColour&** *colour*)

Sets the background colour of the window.

Parameters

colour

The colour to be used as the background colour.

Remarks

The background colour is usually painted by the default
wxWindow::OnEraseBackground (p. 1215) event handler function under Windows and
automatically under GTK.

Note that setting the background colour does not cause an immediate refresh, so you
may wish to call *wxWindow::Clear* (p. 1195) or *wxWindow::Refresh* (p. 1225) after
calling this function.

Use this function with care under GTK as the new appearance of the window might not
look equally well when used with "Themes", i.e GTK's ability to change its look as the
user wishes with run-time loadable modules.

See also

wxWindow::GetBackgroundColour (p. 1200), *wxWindow::SetForegroundColour* (p.
1231), *wxWindow::GetForegroundColour* (p. 1202), *wxWindow::Clear* (p. 1195),
wxWindow::Refresh (p. 1225), *wxWindow::OnEraseBackground* (p. 1215)

wxWindow::SetCaret

void SetCaret(**wxCaret** ** caret*) **const**

Sets the *caret* (p. 105) associated with the window.

wxWindow::SetClientSize

virtual void SetClientSize(**int** *width*, **int** *height*)

virtual void SetClientSize(**const wxSize&** *size*)

This sets the size of the window client area in pixels. Using this function to size a window
tends to be more device-independent than *wxWindow::SetSize* (p. 1234), since the
application need not worry about what dimensions the border or title bar have when
trying to fit the window around panel items, for example.

Parameters

width
> The required client area width.

height
> The required client area height.

size
> The required client size.

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **SetClientSize(size)**   Accepts a wxSize
> **SetClientSizeWH(width, height)**

wxWindow::SetCursor

virtual void SetCursor(**const wxCursor&***cursor*)

Sets the window's cursor. Notice that the window cursor also sets it for the children of the window implicitly.

The *cursor* may be `wxNullCursor` in which case the window cursor will be reset back to default.

Parameters

cursor
>   Specifies the cursor that the window should normally display.

See also

::wxSetCursor (p. 1269), *wxCursor* (p. 184)

wxWindow::SetConstraints

void SetConstraints(**wxLayoutConstraints*** *constraints*)

Sets the window to have the given layout constraints. The window will then own the object, and will take care of its deletion. If an existing layout constraints object is already owned by the window, it will be deleted.

Parameters

constraints
>   The constraints to set. Pass NULL to disassociate and delete the window's constraints.

Remarks

You must call *wxWindow::SetAutoLayout* (p. 1227) to tell a window to use the constraints automatically in OnSize; otherwise, you must override OnSize and call Layout() explicitly. When setting both a wxLayoutConstraints and a *wxSizer* (p. 929), only the sizer will have effect.

wxWindow::SetDropTarget

void SetDropTarget(**wxDropTarget*** *target*)

Associates a drop target with this window.

If the window already has a drop target, it is deleted.

See also

wxWindow::GetDropTarget (p. 1201),*Drag and drop overview*(p. 1430)

wxWindow::SetEventHandler

void SetEventHandler(**wxEvtHandler*** *handler*)

Sets the event handler for this window.

Parameters

handler
    Specifies the handler to be set.

Remarks

An event handler is an object that is capable of processing the events sent to a window. By default, the window is its own event handler, but an application may wish to substitute another, for example to allow central implementation of event-handling for a variety of different window classes.

It is usually better to use *wxWindow::PushEventHandler* (p. 1224) since this sets up a chain of event handlers, where an event not handled by one event handler is handed to the next one in the chain.

See also

wxWindow::GetEventHandler (p. 1201), *wxWindow::PushEventHandler* (p. 1224), *wxWindow::PopEventHandler* (p. 1224), *wxEvtHandler::ProcessEvent* (p. 384), *wxEvtHandler* (p. 380)

wxWindow::SetExtraStyle

void SetExtraStyle(**long** *exStyle*)

Sets the extra style bits for the window. The currently defined extra style bits are:

wxWS_EX_VALIDATE_RECURSIVELY   TransferDataTo/FromWindow() and

Validate() methods will recursively descend into all children of the window if it has this style flag set.

wxWindow::SetFocus

virtual void SetFocus()

This sets the window to receive keyboard input.

wxWindow::SetFont

void SetFont(**const wxFont&** *font*)

Sets the font for this window.

Parameters

font
    Font to associate with this window.

See also

wxWindow::GetFont (p. 1202)

wxWindow::SetForegroundColour

virtual void SetForegroundColour(**const wxColour&** *colour*)

Sets the foreground colour of the window.

Parameters

colour
    The colour to be used as the foreground colour.

Remarks

The interpretation of foreground colour is open to interpretation according to the window class; it may be the text colour or other colour, or it may not be used at all.

Note that when using this functions under GTK, you will disable the so called "themes", i.e. the user chosen apperance of windows and controls, including the themes of their parent windows.

See also

wxWindow::GetForegroundColour (p. 1202), *wxWindow::SetBackgroundColour* (p. 1227), *wxWindow::GetBackgroundColour* (p. 1200)

wxWindow::SetId

void SetId(**int** *id*)

Sets the identifier of the window.

Remarks

Each window has an integer identifier. If the application has not provided one, an identifier will be generated. Normally, the identifier should be provided on creation and should not be modified subsequently.

See also

wxWindow::GetId (p. 1203), *Window identifiers* (p. 1376)

wxWindow::SetName

virtual void SetName (**const wxString&** *name*)

Sets the window's name.

Parameters

name
     A name to set for the window.

See also

wxWindow::GetName (p. 1203)

wxWindow::SetPalette

virtual void SetPalette (**wxPalette*** *palette*)

Obsolete - use *wxDC::SetPalette* (p. 296) instead.

wxWindow::SetScrollbar

virtual void SetScrollbar(**int** *orientation*, **int** *position*, **int** *thumbSize*, **int** *range*, **bool** *refresh* = *TRUE*)

Sets the scrollbar properties of a built-in scrollbar.

Parameters

orientation
>   Determines the scrollbar whose page size is to be set. May be wxHORIZONTAL or wxVERTICAL.

position
>   The position of the scrollbar in scroll units.

thumbSize
>   The size of the thumb, or visible portion of the scrollbar, in scroll units.

range
>   The maximum position of the scrollbar.

refresh
>   TRUE to redraw the scrollbar, FALSE otherwise.

Remarks

Let's say you wish to display 50 lines of text, using the same font. The window is sized so that you can only see 16 lines at a time.

You would use:

```
SetScrollbar(wxVERTICAL, 0, 16, 50);
```

Note that with the window at this size, the thumb position can never go above 50 minus 16, or 34.

You can determine how many lines are currently visible by dividing the current view size by the character height in pixels.

When defining your own scrollbar behaviour, you will always need to recalculate the scrollbar settings when the window size changes. You could therefore put your scrollbar calculations and SetScrollbar call into a function named AdjustScrollbars, which can be called initially and also from your *wxWindow::OnSize* (p. 1222) event handler function.

See also

Scrolling overview (p. 1395), *wxScrollBar* (p. 907), *wxScrolledWindow* (p. 916)

wxWindow::SetScrollPos

virtual void SetScrollPos(**int** *orientation*, **int** *pos*, **bool** *refresh = TRUE*)

Sets the position of one of the built-in scrollbars.

Parameters

orientation

Determines the scrollbar whose position is to be set. May be wxHORIZONTAL or wxVERTICAL.

pos

Position in scroll units.

refresh

TRUE to redraw the scrollbar, FALSE otherwise.

Remarks

This function does not directly affect the contents of the window: it is up to the application to take note of scrollbar attributes and redraw contents accordingly.

See also

wxWindow::SetScrollbar (p. 1232), *wxWindow::GetScrollPos* (p. 1233), *wxWindow::GetScrollThumb* (p. 1204), *wxScrollBar* (p. 907), *wxScrolledWindow* (p. 916)

wxWindow::SetSize

virtual void SetSize(**int** *x*, **int** *y*, **int** *width*, **int** *height*, **int** *sizeFlags = wxSIZE_AUTO*)

virtual void SetSize(**const wxRect&** *rect*)

Sets the size and position of the window in pixels.

virtual void SetSize(**int** *width*, **int** *height*)

virtual void SetSize(**const wxSize&** *size*)

Sets the size of the window in pixels.

Parameters

x

Required x position in pixels, or -1 to indicate that the existing value should be used.

y

Required y position in pixels, or -1 to indicate that the existing value should be used.

width

Required width in pixels, or -1 to indicate that the existing value should be used.

height
> Required height position in pixels, or -1 to indicate that the existing value should be used.

size
> *wxSize* (p. 926) object for setting the size.

rect
> *wxRect* (p. 873) object for setting the position and size.

sizeFlags
> Indicates the interpretation of other parameters. It is a bit list of the following:

> **wxSIZE_AUTO_WIDTH**: a -1 width value is taken to indicate a wxWindows-supplied default width.
> **wxSIZE_AUTO_HEIGHT**: a -1 height value is taken to indicate a wxWindows-supplied default width.
> **wxSIZE_AUTO**: -1 size values are taken to indicate a wxWindows-supplied default size.
> **wxSIZE_USE_EXISTING**: existing dimensions should be used if -1 values are supplied.
> **wxSIZE_ALLOW_MINUS_ONE**: allow dimensions of -1 and less to be interpreted as real dimensions, not default values.

Remarks

The second form is a convenience for calling the first form with default x and y parameters, and must be used with non-default width and height values.

The first form sets the position and optionally size, of the window. Parameters may be -1 to indicate either that a default should be supplied by wxWindows, or that the current value of the dimension should be used.

See also

wxWindow::Move (p. 1210)

wxPython note: In place of a single overloaded method name, wxPython implements the following methods:

> **SetDimensions(x, y, width, height, sizeFlags=wxSIZE_AUTO)**
> **SetSize(size)**
> **SetPosition(point)**

wxWindow::SetSizeHints

virtual void SetSizeHints(**int** *minW=-1*, **int** *minH=-1*, **int** *maxW=-1*, **int** *maxH=-1*, **int** *incW=-1*, **int** *incH=-1*)

Allows specification of minimum and maximum window sizes, and window size increments. If a pair of values is not set (or set to -1), the default values will be used.

Parameters

minW

Specifies the minimum width allowable.

minH

Specifies the minimum height allowable.

maxW

Specifies the maximum width allowable.

maxH

Specifies the maximum height allowable.

incW

Specifies the increment for sizing the width (Motif/Xt only).

incH

Specifies the increment for sizing the height (Motif/Xt only).

Remarks

If this function is called, the user will not be able to size the window outside the given bounds.

The resizing increments are only significant under Motif or Xt.

wxWindow::SetSizer

void SetSizer(**wxSizer*** *sizer*)

Sets the window to have the given layout sizer. The window will then own the object, and will take care of its deletion. If an existing layout constraints object is already owned by the window, it will be deleted.

Parameters

sizer

The sizer to set. Pass NULL to disassociate and delete the window's sizer.

Remarks

You must call *wxWindow::SetAutoLayout* (p. 1227) to tell a window to use the sizer automatically in OnSize; otherwise, you must override OnSize and call Layout() explicitly. When setting both a wxSizer and a *wxLayoutConstraints* (p. 616), only the sizer will have effect.

wxWindow::SetTitle

virtual void SetTitle(**const wxString&** *title*)

Sets the window's title. Applicable only to frames and dialogs.

Parameters

title
    The window's title.

See also

wxWindow::GetTitle (p. 1206)

wxWindow::SetValidator

virtual void SetValidator(**const wxValidator&** *validator*)

Deletes the current validator (if any) and sets the window validator, having called wxValidator::Clone to create a new validator of this type.

wxWindow::SetToolTip

void SetToolTip(**const wxString&** *tip*)

void SetToolTip(**wxToolTip*** *tip*)

Attach a tooltip to the window.

See also: *GetToolTip* (p. 1237),   *wxToolTip* (p. 1138)

wxWindow::GetToolTip

wxToolTip* GetToolTip() **const**

Get the associated tooltip or NULL if none.

wxWindow::SetWindowStyle

void SetWindowStyle(**long** *style*)

Identical to *SetWindowStyleFlag* (p. 1237).

wxWindow::SetWindowStyleFlag

virtual void SetWindowStyleFlag(**long** *style*)

Sets the style of the window. Please note that some styles cannot be changed after the window creation and that *Refresh()* (p. 1225) might be called after changing the others for the change to take place immediately.

See *Window styles* (p. 1379) for more information about flags.

See also

GetWindowStyleFlag (p. 1207)

wxWindow::Show

virtual bool Show(**bool** *show*)

Shows or hides the window.

Parameters

show
    If TRUE, displays the window and brings it to the front. Otherwise, hides the window.

See also

wxWindow::IsShown (p. 1208)

wxWindow::TransferDataFromWindow

virtual bool TransferDataFromWindow()

Transfers values from child controls to data areas specified by their validators. Returns FALSE if a transfer failed.

If the window has `wxWS_EX_VALIDATE_RECURSIVELY` extra style flag set, the method will also call TransferDataFromWindow() of all child windows.

See also

wxWindow::TransferDataToWindow (p. 1238), *wxValidator* (p. 1172), *wxWindow::Validate* (p. 1239)

wxWindow::TransferDataToWindow

virtual bool TransferDataToWindow()

Transfers values to child controls from data areas specified by their validators.

If the window has `wxWS_EX_VALIDATE_RECURSIVELY` extra style flag set, the method will also call TransferDataToWindow() of all child windows.

Return value

Returns FALSE if a transfer failed.

See also

wxWindow::TransferDataFromWindow (p. 1238), *wxValidator* (p. 1172), *wxWindow::Validate* (p. 1239)

wxWindow::Validate

virtual bool Validate()

Validates the current values of the child controls using their validators.

If the window has `wxWS_EX_VALIDATE_RECURSIVELY` extra style flag set, the method will also call Validate() of all child windows.

Return value

Returns FALSE if any of the validations failed.

See also

wxWindow::TransferDataFromWindow (p. 1238), *wxWindow::TransferDataFromWindow* (p. 1238), *wxValidator* (p. 1172)

wxWindow::WarpPointer

void WarpPointer(**int** *x*, **int** *y*)

Moves the pointer to the given position on the window.

Parameters

x

    The new x position for the cursor.

y

    The new y position for the cursor.

wxWindowDC

A wxWindowDC must be constructed if an application wishes to paint on the whole area of a window (client and decorations). This should normally be constructed as a temporary stack object; don't store a wxWindowDC object.

To draw on a window from inside **OnPaint**, construct a *wxPaintDC* (p. 763) object.

To draw on the client area of a window from outside **OnPaint**, construct a *wxClientDC* (p. 121) object.

To draw on the whole window including decorations, construct a *wxWindowDC* (p. 1240) object (Windows only).

Derived from

wxDC (p. 282)

Include files

<wx/dcclient.h>

See also

wxDC (p. 282), *wxMemoryDC* (p. 682), *wxPaintDC* (p. 763), *wxClientDC* (p. 121), *wxScreenDC* (p. 906)

wxWindowDC::wxWindowDC

wxWindowDC(**wxWindow*** *window*)

Constructor. Pass a pointer to the window on which you wish to paint.

wxWindowDisabler

This class disables all windows of the application (may be with the exception of one of them) in its constructor and enables them back in its destructor. This comes in handy when you want to indicate to the user that the application is currently busy and cannot respond to user input.

Derived from

None

Include files

<wx/utils.h>

See also

wxBusyCursor (p. 88)

wxWindowDisabler::wxWindowDisabler

wxWindowDisabler(**wxWindow** * *winToSkip* = *NULL*)

Disables all top level windows of the applications with the exception of *winToSkip* if it is not NULL.

wxWindowDisabler::~wxWindowDisabler

Reenables back the windows disabled by the constructor.

wxWizard

wxWizard is the central class for implementing 'wizard-like' dialogs. These dialogs are mostly familiar to Windows users and are nothing else but a sequence of 'pages' each of them displayed inside a dialog which has the buttons to pas to the next (and previous) pages.

The wizards are typically used to decompose a complex dialog into several simple steps and are mainly useful to the novice users, hence it is important to keep them as simple as possible.

To show a wizard dialog, you must first create an object of wxWizard class using *Create* (p. 1242) function. Then you should add all pages you want the wizard to show and call *RunWizard* (p. 1243). Finally, don't forget to call wizard->Destroy().

Derived from

wxDialog (p. 312)
wxPanel (p. 769)
wxWindow (p. 1190)

wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/wizard.h>

Event table macros

To process input from a wizard dialog, use these event handler macros to direct input to member functions that take a *wxWizardEvent* (p. 1243) argument. For some events, *Veto()* (p. 750) can be called to prevent the event from happening.

EVT_WIZARD_PAGE_CHANGED(id, func)   The page has been just changed (this event can not be vetoed).

EVT_WIZARD_PAGE_CHANGING(id, func)   The page is being changed (this event can be vetoed).

EVT_WIZARD_CANCEL(id, func)   The user attempted to cancel the wizard (this event may also be vetoed).

See also

wxWizardEvent (p. 1243), *wxWizardPage* (p. 1245), *wxWizard sample* (p. 1335)

wxWizard::Create

static wxWizard* Create(**wxWindow*** *parent*, **int** *id = -1*, **const wxString&** *title = wxEmptyString*, **const wxBitmap&** *bitmap = wxNullBitmap*, **const wxPoint&** *pos = wxDefaultPosition*)

Creates the wizard dialog. The returned pointer should not be deleted directly, you should rather call `Destroy()` on it and wxWindows will delete it itself.

Notice that unlike almost all other wxWindows classes, there is no *size* parameter in wxWizard constructor because the wizard will have a predefined default size by default. If you want to change this, you should use the *SetPageSize* (p. 1243) function.

Parameters

parent
    The parent window, may be NULL.

id
    The id of the dialog, will usually be just -1.

title
> The title of the dialog.

bitmap
> The default bitmap used in the left side of the wizard. See also *GetBitmap* (p. 1246).

pos
> The position of the dialog, it will be centered on the screen by default.

wxWizard::RunWizard

bool RunWizard(wxWizardPage* *firstPage*)

Executes the wizard starting from the given page, returns TRUE if it was successfully finished or FALSE if user cancelled it. The *firstPage* can not be NULL.

wxWizard::GetCurrentPage

wxWizardPage* GetCurrentPage() const

Get the current page while the wizard is running. NULL is returned if *RunWizard()* (p. 1243) is not being executed now.

wxWizard::GetPageSize

wxSize GetPageSize() const

Returns the size available for the pages.

wxWizard::SetPageSize

void SetPageSize(const wxSize& *sizePage*)

Sets the minimal size to be made available for the wizard pages. The wizard will take into account the size of the bitmap (if any) itself. Also, the wizard will never be smaller than the default size.

The recommended way to use this function is to layout all wizard pages using the sizers (even though the wizard is not resizeable) and then use *wxSizer::CalcMin* (p. 931) in a loop to calculate the maximum of minimal sizes of the pages and pass it to SetPageSize().

wxWizardEvent

wxWiz ardEvent class represents an event generated by the *wizard* (p. 1241): this event is first sent to the page itself and, if not processed there, goes up the window hierarchy as usual.

Derived from

wxNotifyEvent (p. 749)
wxCommandEvent (p. 153)
wxEvent (p. 377)
wxObject (p. 750)

Include files

<wx/wizard.h>

Event table macros

To process input from a wizard dialog, use these event handler macros to direct input to member functions that take a wxWizardEvent argument.

EVT_WIZARD_PAGE_CHANGED(id, func) The page has been just changed (this event can not be vetoed).

EVT_WIZARD_PAG E_CHANGING(id, func) The page is being changed (this event can be vetoed).

EVT_WIZARD_CANCEL(id, func) The user attempted to cancel the wizard (this event may also be vetoed).

See also

wxWizard (p. 1241), *wxWizard sample* (p. 1335)

wxWizardEvent::wxWizardEvent

 wxWizardEvent(**wxEventType** *type* = *wxEVT_NULL*, **int** *id* = *-1*, **bool** *direction* = *TRUE*)

Constructor. It is not normally used by the user code as the objects of this type are constructed by wxWizard.

wxWizardEvent::GetDirection

bool GetDirection() **const**

Return the direction in which the page is changing: for EVT_WIZARD_PAGE_CHANGING, return TRUE if we're going forward or FALSE otherwise and for EVT_WIZARD_PAGE_CHANGED return TRUE if we came from the previous page and FALSE if we returned from the next one.

wxWizardPage

wxWizardPage is one of the screens in *wxWizard* (p. 1241): it must know what are the following and preceding pages (which may be NULL for the first/last page). Except for this extra knowledge, wxWizardPage is just a panel, so the controls may be placed directly on it in the usual way.

This class allows to decide what is the orde fo pages in the wizard dynamically (during run-time) and so providex maximal flexibility. Usually, however, the order of pages is known in advance in which case *wxWizardPageSimple* (p. 1246) class is enough and it is simpler to use.

Virtual functions to override

To use this class, you must override *GetPrev* (p. 1246) and *GetNext* (p. 1246) pure virtual functions (or you may use *wxWizardPageSimple* (p. 1246) instead).

GetBitmap (p. 1246) can also be overridden, but this should be very rarely needed.

Derived from

wxPanel (p. 769)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/wizard.h>

See also

wxWizard (p. 1241), *wxWizard sample* (p. 1335)

wxWizardPage::wxWizardPage

wxWizardPage(**wxWizard*** *parent*, **const wxBitmap&** *bitmap* = *wxNullBitmap*)

Constructor accepts an optional bitmap which will be used for this page instead of the default one for this wizard (note that all bitmaps used should be of the same size). Notice that no other parameters are needed because the wizard will resize and reposition the page anyhow.

wxWizardPage::GetPrev

wxWizardPage* GetPrev() **const**

Get the page which should be shown when the user chooses the "Back" button: if NULL is returned, this button will be disabled. The first page of the wizard will usually return NULL from here, but the others will not.

See also

GetNext (p. 1246)

wxWizardPage::GetNext

wxWizardPage* GetNext() **const**

Get the page which should be shown when the user chooses the "Next" button: if NULL is returned, this button will be disabled. The last page of the wizard will usually return NULL from here, but the others will not.

See also

GetPrev (p. 1246)

wxWizardPage::GetBitmap

wxBitmap GetBitmap() **const**

This method is called by wxWizard to get the bitmap to display alongside the page. By default, m_bitmap member variable which was set in the *constructor* (p. 1245).

If the bitmap was not explicitly set (i.e. if wxNullBitmap is returned), the default bitmap for the wizard should be used.

The only cases when you would want to override this function is if the page bitmap depends dynamically on the user choices, i.e. almost never.

wxWizardPageSimple

wxWizardPageSimple is the simplest possible *wxWizardPage* (p. 1245) implementation: it just returns the pointers given to its constructor from GetNext() and GetPrev() functions.

This makes it very easy to use the obejcts of this class in the wizards where the pages order is known statically - on the other hand, if this is not the case you must derive your own class from *wxWizardPage* (p. 1245) instead.

Derived from

wxWizardPage (p. 1245)
wxPanel (p. 769)
wxWindow (p. 1190)
wxEvtHandler (p. 380)
wxObject (p. 750)

Include files

<wx/wizard.h>

See also

wxWizard (p. 1241), *wxWizard sample* (p. 1335)

wxWizardPageSimple::wxWizardPageSimple

 wxWizardPageSimple(**wxWizard*** *parent = NULL*, **wxWizardPage*** *prev = NULL*, **wxWizardPage*** *next = NULL*)

Constructor takes the previous and next pages. They may be modified later by *SetPrev()* (p. 1247) or *SetNext()* (p. 1247).

wxWizardPageSimple::SetPrev

void SetPrev(**wxWizardPage*** *prev*)

Sets the previous page.

wxWizardPageSimple::SetNext

void SetNext(**wxWizardPage*** *next*)

Sets the next page.

wxWizardPageSimple::Chain

static void Chain(**wxWizardPageSimple*** *first*, **wxWizardPageSimple*** *second*)

A convenience function to make the pages follow each other.

Example:
```
wxRadioboxPage *page3 = new wxRadioboxPage(wizard);
wxValidationPage *page4 = new wxValidationPage(wizard);

wxWizardPageSimple::Chain(page3, page4);
```

wxZipInputStream

This class is input stream from ZIP archive. The archive must be local file (accessible via FILE*). It has all features including GetSize and seeking.

Note

If you need to enumerate files in ZIP archive, you can use *wxFileSystem* (p. 425) together with wxZipFSHandler (see *the overview* (p. 1370).

Derived from

wxInputStream (p. 595)

Include files

<wx/zipstrm.h>

wxZipInputStream::*wxZipInputStream*

 wxZipInputStream(**const wxString&** *archive*, **const wxString&** *file*)

Constructor.

Parameters

archive
     name of ZIP file

file
     name of file stored in the archive

wxZlibInputStream

This stream uncompresses all data read from it. It uses the "filtered" stream to get new compressed data.

Derived from

wxFilterInputStream (p. 435)

Include files

<wx/zstream.h>

See also

wxInputStream (p. 595)

wxZlibOutputStream

This stream compresses all data written to it, and passes the compressed data to the "filtered" stream.

Derived from

wxFilterOutputStream (p. 435)

Include files

<wx/zstream.h>

See also

wxOutputStream (p. 755)

wxZlibOutputStream::wxZlibOutputStream

wxZlibOutputStream(**wxOutputStream&** *stream*,**int** *level = -1*)

Creates a new write-only compressed stream. *level* means level of compression. It is number between 0 and 9 (including these values) where 0 means no compression and 9

best but slowest compression. -1 is default value (currently equivalent to 6).

Chapter 6 Functions

The functions and macros defined in wxWindows are described here.

Version macros

The following constants are defined in wxWindows:

- `wxMAJOR_VERSION` is the major version of wxWindows
- `wxMINOR_VERSION` is the minor version of wxWindows
- `wxRELASE_NUMBER` is the release number

For example, the values or these constants for wxWindows 2.1.15 are 2, 1 and 15.

Additionally, `wxVERSION_STRING` is a user-readable string containing the full wxWindows version and `wxVERSION_NUMBER` is a combination of the three version numbers above: for 2.1.15, it is 2115 and it is 2200 for wxWindows 2.2.

Include files

<wx/version.h> or <wx/defs.h>

wxCHECK_VERSION

bool wxCHECK_VERSION(*major, minor, release*)

This is a macro which evaluates to true if the current wxWindows version is at least major.minor.release.

For example, to test if the program is compiled with wxWindows 2.2 or higher, the following can be done:

```
    wxString s;
#if wxCHECK_VERSION(2, 2, 0)
    if ( s.StartsWith("foo") )
#else // replacement code for old version
    if ( strncmp(s, "foo", 3) == 0 )
#endif
    {
        ...
    }
```

Thread functions

Include files

<wx/thread.h>

See also

wxThread (p. 1106), *wxMutex* (p. 735), *Multithreading overview* (p. 1429)

::wxMutexGuiEnter

void wxMutexGuiEnter()

This function must be called when any thread other than the main GUI thread wants to get access to the GUI library. This function will block the execution of the calling thread until the main thread (or any other thread holding the main GUI lock) leaves the GUI library and no other thread will enter the GUI library until the calling thread calls *::wxMutexGuiLeave()* (p. 1252).

Typically, these functions are used like this:

```
void MyThread::Foo(void)
{
    // before doing any GUI calls we must ensure that this thread is
the only
    // one doing it!

    wxMutexGuiEnter();

    // Call GUI here:
    my_window->DrawSomething();

    wxMutexGuiLeave();
}
```

Note that under GTK, no creation of top-level windows is allowed in any thread but the main one.

This function is only defined on platforms which support preemptive threads.

::wxMutexGuiLeave

void wxMutexGuiLeave()

See *::wxMutexGuiEnter()* (p. 1252).

This function is only defined on platforms which support preemptive threads.

File functions

Include files

<wx/utils.h>

See also

wxPathList (p. 773), *wxDir* (p. 325), *wxFile* (p. 398)

::wxDirExists

bool wxDirExists(**const wxString&** *dirname*)

Returns TRUE if the directory exists.

::wxDos2UnixFilename

void Dos2UnixFilename (**const wxString&** *s*)

Converts a DOS to a Unix filename by replacing backslashes with forward slashes.

::wxFileExists

bool wxFileExists(**const wxString&** *filename*)

Returns TRUE if the file exists. It also returns TRUE if the file is a directory.

::wxFileModificationTime

time_t wxFileModificationTime (**const wxString&** *filename*)

Returns time of last modification of given file.

::wxFileNameFromPath

wxString wxFileNameFromPath(**const wxString&** *path*)

char* wxFileNameFromPath(**char*** *path*)

Returns the filename for a full path. The second form returns a pointer to temporary storage that should not be deallocated.

::wxFindFirstFile

wxString wxFindFirstFile(**const char***spec*, **int** *flags = 0*)

This function does directory searching; returns the first file that matches the path *spec*, or the empty string. Use *wxFindNextFile* (p. 1254) to get the next matching file. Neither will report the current directory "." or the parent directory "..".

spec may contain wildcards.

flags may be wxDIR for restricting the query to directories, wxFILE for files or zero for either.

For example:

```
wxString f = wxFindFirstFile("/home/project/*.*");
while ( !f.IsEmpty() )
{
  ...
  f = wxFindNextFile();
}
```

::wxFindNextFile

wxString wxFindNextFile()

Returns the next file that matches the path passed to *wxFindFirstFile* (p. 1254).

See *wxFindFirstFile* (p. 1254) for an example.

::wxGetOSDirectory

wxString wxGetOSDirectory()

Returns the Windows directory under Windows; on other platforms returns the empty string.

::wxIsAbsolutePath

bool wxIsAbsolutePath(**const wxString&** *filename*)

Returns TRUE if the argument is an absolute filename, i.e. with a slash or drive name at the beginning.

::wxPathOnly

wxString wxPathOnly(**const wxString&** *path*)

Returns the directory part of the filename.

::wxUnix2DosFilename

void wxUnix2DosFilename (**const wxString&** *s*)

Converts a Unix to a DOS filename by replacing forward slashes with backslashes.

::wxConcatFiles

bool wxConcatFiles(**const wxString&** *file1*, **const wxString&** *file2*, **const wxString&** *file3*)

Concatenates *file1* and *file2* to *file3*, returning TRUE if successful.

::wxCopyFile

bool wxCopyFile (**const wxString&** *file1*, **const wxString&** *file2*)

Copies *file1* to *file2*, returning TRUE if successful.

::wxGetCwd

wxString wxGetCwd ()

Returns a string containing the current (or working) directory.

::wxGetWorkingDirectory

wxString wxGetWorkingDirectory(**char****buf=NULL*, **int** *sz=1000*)

This function is obsolete: use *wxGetCwd* instead.

Copies the current working directory into the buffer if supplied, or copies the working directory into new storage (which you must delete yourself) if the buffer is NULL.

sz is the size of the buffer if supplied.

::wxGetTempFileName

char* wxGetTempFileName(**const wxString&** *prefix*, **char*** *buf=NULL*)

bool wxGetTempFileName(**const wxString&** *prefix*, **wxString&** *buf*)

Makes a temporary filename based on *prefix*, opens and closes the file, and places the name in *buf*. If *buf* is NULL, new store is allocated for the temporary filename using *new*.

Under Windows, the filename will include the drive and name of the directory allocated for temporary files (usually the contents of the TEMP variable). Under Unix, the /tmp directory is used.

It is the application's responsibility to create and delete the file.

::wxIsWild

bool wxIsWild(**const wxString&** *pattern*)

Returns TRUE if the pattern contains wildcards. See *wxMatchWild* (p. 1256).

::wxMatchWild

bool wxMatchWild(**const wxString&** *pattern*, **const wxString&** *text*, **bool** *dot_special*)

Returns TRUE if the *pattern* matches the *text*; if *dot_special* is TRUE, filenames beginning with a dot are not matched with wildcard characters. See *wxIsWild* (p. 1256).

::wxMkdir

bool wxMkdir(**const wxString&** *dir*, **int** *perm = 0777*)

Makes the directory *dir*, returning TRUE if successful.

perm is the access mask for the directory for the systems on which it is supported (Unix) and doesn't have effect for the other ones.

::wxRemoveFile

bool wxRemoveFile(**const wxString&** *file*)

Removes *file*, returning TRUE if successful.

::wxRenameFile

bool wxRenameFile(**const wxString&** *file1*, **const wxString&** *file2*)

Renames *file1* to *file2*, returning TRUE if successful.

::wxRmdir

bool wxRmdir(**const wxString&** *dir*, **int** *flags=0*)

Removes the directory *dir*, returning TRUE if successful. Does not work under VMS.

The *flags* parameter is reserved for future use.

::wxSetWorkingDirectory

bool wxSetWorkingDirectory(**const wxString&** *dir*)

Sets the current working directory, returning TRUE if the operation succeeded. Under MS Windows, the current drive is also changed if *dir* contains a drive specification.

::wxSplitPath

void wxSplitPath(**const char *** *fullname*, **wxString *** *path*, **wxString *** *name*, **wxString *** *ext*)

This function splits a full file name into components: the path (including possible disk/drive specification under Windows), the base name and the extension. Any of the output parameters (*path*, *name* or *ext*) may be NULL if you are not interested in the value of a particular component.

wxSplitPath() will correctly handle filenames with both DOS and Unix path separators under Windows, however it will not consider backslashes as path separators under Unix (where backslash is a valid character in a filename).

On entry, *fullname* should be non-NULL (it may be empty though).

On return, *path* contains the file path (without the trailing separator), *name* contains the file name and *ext* contains the file extension without leading dot. All three of them may be empty if the corresponding component is. The old contents of the strings pointed to by these parameters will be overwritten in any case (if the pointers are not NULL).

::wxTransferFileToStream

bool wxTransferFileToStream(**const wxString&** *filename*, **ostream&** *stream*)

Copies the given file to *stream*. Useful when converting an old application to use

streams (within the document/view framework, for example).

Use of this function requires the file wx_doc.h to be included.

::wxTransferStreamToFile

bool wxTransferStreamToFile (**istream&** *stream* **const wxString&** *filename*)

Copies the given stream to the file *filename*. Useful when converting an old application to use streams (within the document/view framework, for example).

Use of this function requires the file wx_doc.h to be included.

Network functions

::wxGetFullHostName

wxString wxGetFullHostName ()

Returns the FQDN (fully qualified domain host name) or an empty string on error.

See also

wxGetHostName (p. 1258)

Include files

<wx/utils.h>

::wxGetEmailAddress

bool wxGetEmailAddress(**const wxString&** *buf*, **int** *sz*)

Copies the user's email address into the supplied buffer, by concatenating the values returned by *wxGetFullHostName* (p. 1258) and *wxGetUserId* (p. 1259).

Returns TRUE if successful, FALSE otherwise.

Include files

<wx/utils.h>

::wxGetHostName

wxString wxGetHostName()

bool wxGetHostName(**char** * *buf*, **int** *sz*)

Copies the current host machine's name into the supplied buffer. Please note that the returned name is *not* fully qualified, i.e. it does not include the domain name.

Under Windows or NT, this function first looks in the environment variable SYSTEM_NAME; if this is not found, the entry **HostName** in the **wxWindows** section of the WIN.INI file is tried.

The first variant of this function returns the hostname if successful or an empty string otherwise. The second (deprecated) function returns TRUE if successful, FALSE otherwise.

See also

wxGetFullHostName (p. 1258)

Include files

<wx/utils.h>

User identification

::wxGetUserId

wxString wxGetUserId()

bool wxGetUserId(**char** * *buf*, **int** *sz*)

This function returns the "user id" also known as "login name" under Unix i.e. something like "jsmith". It uniquely identifies the current user (on this system).

Under Windows or NT, this function first looks in the environment variables USER and LOGNAME; if neither of these is found, the entry **UserId** in the **wxWindows** section of the WIN.INI file is tried.

The first variant of this function returns the login name if successful or an empty string otherwise. The second (deprecated) function returns TRUE if successful, FALSE otherwise.

See also

wxGetUserName (p. 1260)

Include files

<wx/utils.h>

::wxGetUserName

wxString wxGetUserName ()

bool wxGetUserName (**char** * *buf*, **int** *sz*)

This function returns the full user name (something like "Mr. John Smith").

Under Windows or NT, this function looks for the entry **UserName** in the **wxWindows** section of the WIN.INI file. If PenWindows is running, the entry **Current** in the section **User** of the PENWIN.INI file is used.

The first variant of this function returns the user name if successful or an empty string otherwise. The second (deprecated) function returns TRUE if successful, FALSE otherwise.

See also

wxGetUserId (p. 1259)

Include files

<wx/utils.h>

String functions

::copystring

char* copystring(**const char*** *s*)

Makes a copy of the string *s* using the C++ new operator, so it can be deleted with the *delete* operator.

::wxStringMatch

bool wxStringMatch(**const wxString&** *s1*, **const wxString&** *s2*,
 bool *subString = TRUE*, **bool** *exact = FALSE*)

Returns TRUE if the substring *s1* is found within *s2*, ignoring case if *exact* is FALSE. If

subString is FALSE, no substring matching is done.

::wxStringEq

bool wxStringEq(**const wxString&** *s1*, **const wxString&** *s2*)

A macro defined as:

```
#define wxStringEq(s1, s2) (s1 && s2 && (strcmp(s1, s2) == 0))
```

::IsEmpty

bool IsEmpty(**const char *** *p*)

Returns TRUE if the string is empty, FALSE otherwise. It is safe to pass NULL pointer to this function and it will return TRUE for it.

::Stricmp

int Stricmp(**const char ****p1*, **const char ****p2*)

Returns a negative value, 0, or positive value if *p1* is less than, equal to or greater than *p2*. The comparison is case-insensitive.

This function complements the standard C function *strcmp()* which performs case-sensitive comparison.

::Strlen

size_t Strlen(**const char *** *p*)

This is a safe version of standard function *strlen()*: it does exactly the same thing (i.e. returns the length of the string) except that it returns 0 if *p* is the NULL pointer.

::wxGetTranslation

const char * wxGetTranslation(**const char *** *str*)

This function returns the translation of string *str* in the current *locale* (p. 652). If the string is not found in any of the loaded message catalogs (see *internationalization overview* (p. 1353)), the original string is returned. In debug build, an error message is logged - this should help to find the strings which were not yet translated. As this function is used very often, an alternative syntax is provided: the _() macro is defined as wxGetTranslation().

::wxSnprintf

int wxSnprintf(**wxChar** *buf, **size_t** *len*, **const wxChar** *format, *...*)

This function replaces the dangerous standard function `sprintf()` and is like `snprintf()` available on some platforms. The only difference with sprintf() is that an additional argument - buffer size - is taken and the buffer is never overflowed.

Returns the number of characters copied to the buffer or -1 if there is not enough space.

See also

wxVsnprintf (p. 1262), *wxString::Printf* (p. 1028)

::wxVsnprintf

int wxVsnprintf(**wxChar** *buf, **size_t** *len*, **const wxChar** *format, **va_list** *argptr*)

The same as *wxSnprintf* (p. 1262) but takes a `va_list` argument instead of arbitrary number of parameters.

See also

wxSnprintf (p. 1262), *wxString::PrintfV* (p. 1028)

Dialog functions

Below are a number of convenience functions for getting input from the user or displaying messages. Note that in these functions the last three parameters are optional. However, it is recommended to pass a parent frame parameter, or (in MS Windows or Motif) the wrong window frame may be brought to the front when the dialog box is popped up.

::wxCreateFileTipProvider

wxTipProvider * **wxCreateFileTipProvider**(**const wxString&** *filename*, **size_t** *currentTip*)

This function creates a *wxTipProvider* (p. 1122) which may be used with *wxShowTip* (p. 1268).

filename
    The name of the file containing the tips, one per line
currentTip

The index of the first tip to show - normally this index is remembered between the 2 program runs.

See also

Tips overview (p. 1428)

Include files

<wx/tipdlg.h>

::wxFileSelector

wxString wxFileSelector(**const wxString&** *message*, **const wxString&** *default_path =*
"",
 const wxString& *default_filename = "",* **const wxString&** *default_extension = "",*
 const wxString& *wildcard = "*.*",* **int** *flags = 0,* **wxWindow** **parent = "",*
 int *x = -1,* **int** *y = -1*)

Pops up a file selector box. In Windows, this is the common file selector dialog. In X, this is a file selector box with the same functionality. The path and filename are distinct elements of a full file pathname. If path is empty, the current directory will be used. If filename is empty, no default filename will be supplied. The wildcard determines what files are displayed in the file selector, and file extension supplies a type extension for the required filename. Flags may be a combination of wxOPEN, wxSAVE, wxOVERWRITE_PROMPT, wxHIDE_READONLY, wxFILE_MUST_EXIST, wxMULTIPLE or 0.

Both the Unix and Windows versions implement a wildcard filter. Typing a filename containing wildcards (*, ?) in the filename text item, and clicking on Ok, will result in only those files matching the pattern being displayed.

The wildcard may be a specification for multiple types of file with a description for each, such as:

```
 "BMP files (*.bmp)|*.bmp|GIF files (*.gif)|*.gif"
```

The application must check for an empty return value (the user pressed Cancel). For example:

```
const wxString& s = wxFileSelector("Choose a file to open");
if (s)
{
  ...
}
```

Include files

<wx/filedlg.h>

::wxGetColourFromUser

wxColour wxGetColourFromUser(**wxWindow** *parent, **const wxColour&** *colInit*)

Shows the colour selection dialog and returns the colour selected by user or invalid colour (use *wxColour::Ok* (p. 138) to test whether a colour is valid) if the dialog was cancelled.

Parameters

parent
    The parent window for the colour selection dialog

colInit
    If given, this will be the colour initially selected in the dialog.

Include files

<wx/colordlg.h>

::wxGetNumberFromUser

long wxGetNumberFromUser(**const wxString&** *message*, **const wxString&** *prompt*, **const wxString&** *caption*, **long** *value*, **long** *min = 0*, **long** *max = 100*, **wxWindow** **parent = NULL*, **const wxPoint&** *pos = wxDefaultPosition*)

Shows a dialog asking the user for numeric input. The dialogs title is set to *caption*, it contains a (possibly) multiline *message* above the single line *prompt* and the zone for entering the number.

The number entered must be in the range *min..max* (both of which should be positive) and *value* is the initial value of it. If the user enters an invalid value or cancels the dialog, the function will return -1.

Dialog is centered on its *parent* unless an explicit position is given in *pos*.

Include files

<wx/textdlg.h>

::wxGetPasswordFromUser

wxString wxGetTextFromUser(**const wxString&** *message*, **const wxString&** *caption = "Input text"*,
 const wxString& *default_value = ""*, **wxWindow** **parent = NULL*)

Similar to *wxGetTextFromUser* (p. 1265) but the text entered in the dialog is not shown

on screen but replaced with stars. This is intended to be used for entering passwords as the function name implies.

Include files

<wx/textdlg.h>

::wxGetTextFromUser

wxString wxGetTextFromUser(**const wxString&** *message*, **const wxString&** *caption = "Input text"*,
 const wxString& *default_value = ""*, **wxWindow** **parent = NULL*,
 int *x = -1*, **int** *y = -1*, **bool** *centre = TRUE*)

Pop up a dialog box with title set to *caption*, *message*, and a *default_value*. The user may type in text and press OK to return this text, or press Cancel to return the empty string.

If *centre* is TRUE, the message text (which may include new line characters) is centred; if FALSE, the message is left-justified.

Include files

<wx/textdlg.h>

::wxGetMultipleChoice

int wxGetMultipleChoice (**const wxString&** *message*, **const wxString&** *caption*, **int** *n*, **const wxString&** *choices[]*,
 int *nsel*, **int** *selection, **wxWindow** **parent = NULL*, **int** *x = -1*, **int** *y = -1*,
 bool *centre = TRUE*, **int** *width=150*, **int** *height=200*)

Pops up a dialog box containing a message, OK/Cancel buttons and a multiple-selection listbox. The user may choose one or more item(s) and press OK or Cancel.

The number of initially selected choices, and array of the selected indices, are passed in; this array will contain the user selections on exit, with the function returning the number of selections. *selection* must be as big as the number of choices, in case all are selected.

If Cancel is pressed, -1 is returned.

choices is an array of *n* strings for the listbox.

If *centre* is TRUE, the message text (which may include new line characters) is centred; if FALSE, the message is left-justified.

Include files

<wx/choicdlg.h>

::wxGetSingleChoice

wxString wxGetSingleChoice (**const wxString&** *message*, **const wxString&** *caption*,
int *n*, **const wxString&** *choices[]*,
 wxWindow **parent = NULL*, **int** *x = -1*, **int** *y = -1*,
 bool *centre = TRUE*, **int** *width=150*, **int** *height=200*)

Pops up a dialog box containing a message, OK/Cancel buttons and a single-selection
listbox. The user may choose an item and press OK to return a string or Cancel to return
the empty string.

choices is an array of *n* strings for the listbox.

If *centre* is TRUE, the message text (which may include new line characters) is centred;
if FALSE, the message is left-justified.

Include files

<wx/choicdlg.h>

::wxGetSingleChoiceIndex

int wxGetSingleChoiceIndex(**const wxString&** *message*, **const wxString&** *caption*,
int *n*, **const wxString&** *choices[]*,
 wxWindow **parent = NULL*, **int** *x = -1*, **int** *y = -1*,
 bool *centre = TRUE*, **int** *width=150*, **int** *height=200*)

As **wxGetSingleChoice** but returns the index representing the selected string. If the
user pressed cancel, -1 is returned.

Include files

<wx/choicdlg.h>

::wxGetSingleChoiceData

wxString wxGetSingleChoiceData(**const wxString&** *message*, **const wxString&**
caption, **int** *n*, **const wxString&** *choices[]*,
 const wxString& *client_data[]*, **wxWindow** **parent = NULL*, **int** *x = -1*,
 int *y = -1*, **bool** *centre = TRUE*, **int** *width=150*, **int** *height=200*)

As **wxGetSingleChoice** but takes an array of client data pointers corresponding to the
strings, and returns one of these pointers.

Include files

<wx/choicdlg.h>

::wxMessageBox

int wxMessageBox(**const wxString&** *message*, **const wxString&** *caption* =
"Message", **int** *style* = *wxOK | wxCENTRE*,
 wxWindow *parent = *NULL*, **int** *x* = *-1*, **int** *y* = *-1*)

General purpose message dialog. *style* may be a bit list of the following identifiers:

wxYES_NO	Puts Yes and No buttons on the message box. May be combined with wxCANCEL.
wxCANCEL	Puts a Cancel button on the message box. May be combined with wxYES_NO or wxOK.
wxOK	Puts an Ok button on the message box. May be combined with wxCANCEL.
wxCENTRE	Centres the text.
wxICON_EXCLAMATION	Displays an exclamation mark symbol.
wxICON_HAND	Displays an error symbol.
wxICON_ERROR	Displays an error symbol - the same as wxICON_HAND.
wxICON_QUESTION	Displays a question mark symbol.
wxICON_INFORMATION	Displays an information symbol.

The return value is one of: wxYES, wxNO, wxCANCEL, wxOK.

For example:

```
...
int answer = wxMessageBox("Quit program?", "Confirm",
                          wxYES_NO | wxCANCEL, main_frame);
if (answer == wxYES)
  delete main_frame;
...
```

message may contain newline characters, in which case the message will be split into separate lines, to cater for large messages.

Under Windows, the native MessageBox function is used unless wxCENTRE is specified in the style, in which case a generic function is used. This is because the native MessageBox function cannot centre text. The symbols are not shown when the generic function is used.

Include files

<wx/msgdlg.h>

::wxShowTip

bool wxShowTip(**wxWindow** *parent, **wxTipProvider** *tipProvider, **bool** *showAtStartup* = *TRUE*)

This function shows a "startup tip" to the user.

parent
    The parent window for the modal dialog

tipProvider
    An object which is used to get the text of the tips. It may be created with the *wxCreateFileTipProvider* (p. 1262) function.

showAtStartup
    Should be TRUE if startup tips are shown, FALSE otherwise. This is used as the initial value for "Show tips at startup" checkbox which is shown in the tips dialog.

See also

Tips overview (p. 1428)

Include files

<wx/tipdlg.h>

GDI functions

The following are relevant to the GDI (Graphics Device Interface).

Include files

<wx/gdicmn.h>

::wxColourDisplay

bool wxColourDisplay()

Returns TRUE if the display is colour, FALSE otherwise.

::wxDisplayDepth

int wxDisplayDepth()

Returns the depth of the display (a value of 1 denotes a monochrome display).

::wxMakeMetafilePlaceable

bool wxMakeMetafilePlaceable(**const wxString&** *filename*, **int** *minX*, **int** *minY*, **int** *maxX*, **int** *maxY*, **float** *scale=1.0*)

Given a filename for an existing, valid metafile (as constructed using *wxMetafileDC* (p. 716)) makes it into a placeable metafile by prepending a header containing the given bounding box. The bounding box may be obtained from a device context after drawing into it, using the functions wxDC::MinX, wxDC::MinY, wxDC::MaxX and wxDC::MaxY.

In addition to adding the placeable metafile header, this function adds the equivalent of the following code to the start of the metafile data:

```
SetMapMode(dc, MM_ANISOTROPIC);
SetWindowOrg(dc, minX, minY);
SetWindowExt(dc, maxX - minX, maxY - minY);
```

This simulates the wxMM_TEXT mapping mode, which wxWindows assumes.

Placeable metafiles may be imported by many Windows applications, and can be used in RTF (Rich Text Format) files.

scale allows the specification of scale for the metafile.

This function is only available under Windows.

::wxSetCursor

void wxSetCursor(**wxCursor** **cursor*)

Globally sets the cursor; only has an effect in Windows and GTK. See also *wxCursor* (p. 184), *wxWindow::SetCursor* (p. 1229).

Printer settings

These routines are obsolete and should no longer be used!

The following functions are used to control PostScript printing. Under Windows, PostScript output can only be sent to a file.

Include files

<wx/dcps.h>

::wxGetPrinterCommand

wxString wxGetPrinterCommand()

Gets the printer command used to print a file. The default is `lpr`.

::wxGetPrinterFile

wxString wxGetPrinterFile()

Gets the PostScript output filename.

::wxGetPrinterMode

int wxGetPrinterMode()

Gets the printing mode controlling where output is sent (PS_PREVIEW, PS_FILE or PS_PRINTER). The default is PS_PREVIEW.

::wxGetPrinterOptions

wxString wxGetPrinterOptions()

Gets the additional options for the print command (e.g. specific printer). The default is nothing.

::wxGetPrinterOrientation

int wxGetPrinterOrientation()

Gets the orientation (PS_PORTRAIT or PS_LANDSCAPE). The default is PS_PORTRAIT.

::wxGetPrinterPreviewCommand

wxString wxGetPrinterPreviewCommand()

Gets the command used to view a PostScript file. The default depends on the platform.

::wxGetPrinterScaling

void wxGetPrinterScaling(**float** *x, **float** *y)

Gets the scaling factor for PostScript output. The default is 1.0, 1.0.

::wxGetPrinterTranslation

void wxGetPrinterTranslation(**float** *x, **float** *y)

Gets the translation (from the top left corner) for PostScript output. The default is 0.0, 0.0.

::wxSetPrinterCommand

void wxSetPrinterCommand(**const wxString&** *command*)

Sets the printer command used to print a file. The default is `lpr`.

::wxSetPrinterFile

void wxSetPrinterFile (**const wxString&** *filename*)

Sets the PostScript output filename.

::wxSetPrinterMode

void wxSetPrinterMode (**int** *mode*)

Sets the printing mode controlling where output is sent (PS_PREVIEW, PS_FILE or PS_PRINTER). The default is PS_PREVIEW.

::wxSetPrinterOptions

void wxSetPrinterOptions(**const wxString&** *options*)

Sets the additional options for the print command (e.g. specific printer). The default is nothing.

::wxSetPrinterOrientation

void wxSetPrinterOrientation(**int** *orientation*)

Sets the orientation (PS_PORTRAIT or PS_LANDSCAPE). The default is PS_PORTRAIT.

::wxSetPrinterPreviewCommand

void wxSetPrinterPreviewCommand(const wxString& *command*)

Sets the command used to view a PostScript file. The default depends on the platform.

::wxSetPrinterScaling

void wxSetPrinterScaling(float *x*, float *y*)

Sets the scaling factor for PostScript output. The default is 1.0, 1.0.

::wxSetPrinterTranslation

void wxSetPrinterTranslation(float *x*, float *y*)

Sets the translation (from the top left corner) for PostScript output. The default is 0.0, 0.0.

Clipboard functions

These clipboard functions are implemented for Windows only. The use of these functions is deprecated and the code is no longer maintained. Use the *wxClipboard* (p. 121) class instead.

Include files

<wx/clipbrd.h>

::wxClipboardOpen

bool wxClipboardOpen()

Returns TRUE if this application has already opened the clipboard.

::wxCloseClipboard

bool wxCloseClipboard()

Closes the clipboard to allow other applications to use it.

::wxEmptyClipboard

bool wxEmptyClipboard()

Empties the clipboard.

::wxEnumClipboardFormats

int wxEnumClipboardFormats(**int***dataFormat*)

Enumerates the formats found in a list of available formats that belong to the clipboard. Each call to this function specifies a known available format; the function returns the format that appears next in the list.

dataFormat specifies a known format. If this parameter is zero, the function returns the first format in the list.

The return value specifies the next known clipboard data format if the function is successful. It is zero if the *dataFormat* parameter specifies the last format in the list of available formats, or if the clipboard is not open.

Before it enumerates the formats function, an application must open the clipboard by using the wxOpenClipboard function.

::wxGetClipboardData

wxObject * **wxGetClipboardData**(**int***dataFormat*)

Gets data from the clipboard.

dataFormat may be one of:

- wxCF_TEXT or wxCF_OEMTEXT: returns a pointer to new memory containing a null-terminated text string.
- wxCF_BITMAP: returns a new wxBitmap.

The clipboard must have previously been opened for this call to succeed.

::wxGetClipboardFormatName

bool wxGetClipboardFormatName(**int***dataFormat*, **const wxString&** *formatName*, **int***maxCount*)

Gets the name of a registered clipboard format, and puts it into the buffer *formatName* which is of maximum length *maxCount*. *dataFormat* must not specify a predefined

clipboard format.

::wxIsClipboardFormatAvailable

bool wxIsClipboardFormatAvailable(**int***dataFormat*)

Returns TRUE if the given data format is available on the clipboard.

::wxOpenClipboard

bool wxOpenClipboard()

Opens the clipboard for passing data to it or getting data from it.

::wxRegisterClipboardFormat

int wxRegisterClipboardFormat(**const wxString&** *formatName*)

Registers the clipboard data format name and returns an identifier.

::wxSetClipboardData

bool wxSetClipboardData(**int***dataFormat*, **wxObject** *data, **int***width*, **int***height*)

Passes data to the clipboard.

dataFormat may be one of:

- wxCF_TEXT or wxCF_OEMTEXT: *data* is a null-terminated text string.
- wxCF_BITMAP: *data* is a wxBitmap.
- wxCF_DIB: *data* is a wxBitmap. The bitmap is converted to a DIB (device independent bitmap).
- wxCF_METAFILE: *data* is a wxMetafile. *width* and *height* are used to give recommended dimensions.

The clipboard must have previously been opened for this call to succeed.

Miscellaneous functions

::wxDROP_ICON

wxIconOrCursor wxDROP_ICON(const char *name)

This macro creates either a cursor (MSW) or an icon (elsewhere) with the given name. Under MSW, the cursor is loaded from the resource file and the icon is loaded from XPM file under other platforms.

This macro should be used with *wxDropSource constructor* (p. 368).

Include files

<wx/dnd.h>

::wxNewId

long wxNewId()

Generates an integer identifier unique to this run of the program.

Include files

<wx/utils.h>

::wxRegisterId

void wxRegisterId(long *id*)

Ensures that ids subsequently generated by **NewId** do not clash with the given **id**.

Include files

<wx/utils.h>

::wxBeginBusyCursor

void wxBeginBusyCursor(wxCursor *cursor = wxHOURGLASS_CURSOR*)

Changes the cursor to the given cursor for all windows in the application. Use *wxEndBusyCursor* (p. 1278) to revert the cursor back to its previous state. These two calls can be nested, and a counter ensures that only the outer calls take effect.

See also *wxIsBusy* (p. 1286), *wxBusyCursor* (p. 88).

Include files

<wx/utils.h>

::wxBell

void wxBell()

Ring the system bell.

Include files

<wx/utils.h>

::wxCreateDynamicObject

wxObject * wxCreateDynamicObject(**const wxString&** *className*)

Creates and returns an object of the given class, if the class has been registered with the dynamic class system using DECLARE... and IMPLEMENT... macros.

::wxDDECleanUp

void wxDDECleanUp()

Called when wxWindows exits, to clean up the DDE system. This no longer needs to be called by the application.

See also *wxDDEInitialize* (p. 1276).

Include files

<wx/dde.h>

::wxDDEInitialize

void wxDDEInitialize()

Initializes the DDE system. May be called multiple times without harm.

This no longer needs to be called by the application: it will be called by wxWindows if necessary.

See also *wxDDEServer* (p. 305), *wxDDEClient* (p. 300), *wxDDEConnection* (p. 301), *wxDDECleanUp* (p. 1276).

Include files

<wx/dde.h>

::wxDebugMsg

void wxDebugMsg(**const wxString&** *fmt*, **...**)

This function is deprecated, use *wxLogDebug* (p. 1305) instead!

Display a debugging message; under Windows, this will appear on the debugger command window, and under Unix, it will be written to standard error.

The syntax is identical to **printf**: pass a format string and a variable list of arguments.

Tip: under Windows, if your application crashes before the message appears in the debugging window, put a wxYield call after each wxDebugMsg call. wxDebugMsg seems to be broken under WIN32s (at least for Watcom C++): preformat your messages and use OutputDebugString instead.

This function is now obsolete, replaced by *Log functions* (p. 1304).

Include files

<wx/utils.h>

::wxDisplaySize

void wxDisplaySize(**int ***width*, **int ***height*)

Gets the physical size of the display in pixels.

Include files

<wx/gdicmn.h>

::wxEnableTopLevelWindows

void wxEnableTopLevelWindow(**bool** *enable* = *TRUE*)

This function enables or disables all top level windows. It is used by *::wxSafeYield* (p. 1288).

Include files

<wx/utils.h>

::wxEntry

This initializes wxWindows in a platform-dependent way. Use this if you are not using the default wxWindows entry code (e.g. main or WinMain). For example, you can initialize

wxWindows from an Microsoft Foundation Classes application using this function.

void wxEntry(**HANDLE** *hInstance*, **HANDLE** *hPrevInstance*, **const wxString&**
commandLine, **int** *cmdShow*, **bool** *enterLoop* = *TRUE*)

wxWindows initialization under Windows (non-DLL). If *enterLoop* is FALSE, the function
will return immediately after calling wxApp::OnInit. Otherwise, the wxWindows message
loop will be entered.

void wxEntry(**HANDLE** *hInstance*, **HANDLE** *hPrevInstance*, **WORD** *wDataSegment*,
WORD *wHeapSize*, **const wxString&** *commandLine*)

wxWindows initialization under Windows (for applications constructed as a DLL).

int wxEntry(**int** *argc*, **const wxString&** **argv*)

wxWindows initialization under Unix.

Remarks

To clean up wxWindows, call wxApp::OnExit followed by the static function
wxApp::CleanUp. For example, if exiting from an MFC application that also uses
wxWindows:

```
int CTheApp::ExitInstance()
{
  // OnExit isn't called by CleanUp so must be called explicitly.
  wxTheApp->OnExit();
  wxApp::CleanUp();

  return CWinApp::ExitInstance();
}
```

Include files

<wx/app.h>

::wxEndBusyCursor

void wxEndBusyCursor()

Changes the cursor back to the original cursor, for all windows in the application. Use
with *wxBeginBusyCursor* (p. 1275).

See also *wxIsBusy* (p. 1286), *wxBusyCursor* (p. 88).

Include files

<wx/utils.h>

::wxError

void wxError(**const wxString&** *msg*, **const wxString&** *title = "wxWindows Internal Error"*)

Displays *msg* and continues. This writes to standard error under Unix, and pops up a message box under Windows. Used for internal wxWindows errors. See also *wxFatalError* (p. 1280).

Include files

<wx/utils.h>

::wxExecute

long wxExecute(**const wxString&** *command*, **bool** *sync = FALSE*, **wxProcess** **callback = NULL*)

long wxExecute(**char** **argv, **bool** *sync = FALSE*, **wxProcess** **callback = NULL*)

long wxExecute(**const wxString&** *command*, **wxArrayString&** *output*)

long wxExecute(**const wxString&** *command*, **wxArrayString&** *output*, **wxArrayString&** *errors*)

Executes another program in Unix or Windows.

The first form takes a command string, such as `"emacs file.txt"`.

The second form takes an array of values: a command, any number of arguments, terminated by NULL.

The semantics of the third and fourth versions is different from the first two and is described in more details below.

If *sync* is FALSE (the default), flow of control immediately returns. If TRUE, the current application waits until the other program has terminated.

In the case of synchronous execution, the return value is the exit code of the process (which terminates by the moment the function returns) and will be-1 if the process couldn't be started and typically 0 if the process terminated successfully. Also, while waiting for the process to terminate, wxExecute will call *wxYield* (p. 1291). The caller should ensure that this can cause no recursion, in the simplest case by calling *wxEnableTopLevelWindows(FALSE)* (p. 1277).

For asynchronous execution, however, the return value is the process id and zero value indicates that the command could not be executed. As an added complication, the return value of -1 in this case indicattes that we didn't launch a new process, but connected to

the running one (this can only happen in case of using DDE under Windows for command execution). In particular, in this, and only this, case the calling code will not get the notification about process termination.

If callback isn't NULL and if execution is asynchronous (note that callback parameter can not be non-NULL for synchronous execution), *wxProcess::OnTerminate* (p. 822) will be called when the process finishes.

Finally, you may use the third overloaded version of this function to execute a process (always synchronously) and capture its output in the array *output*. The fourth version adds the possibility to additionally capture the messages from standard error output in the *errors* array.

See also *wxShell* (p. 1288), *wxProcess* (p. 820), *Exec sample* (p. 1330).

Include files

<wx/utils.h>

::wxExit

void wxExit()

Exits application after calling *wxApp::OnExit* (p. 26). Should only be used in an emergency: normally the top-level frame should be deleted (after deleting all other frames) to terminate the application. See *wxWindow::OnCloseWindow* (p. 1213) and *wxApp* (p. 21).

Include files

<wx/app.h>

::wxFatalError

void wxFatalError(**const wxString&** *msg*, **const wxString&** *title* = *"wxWindows Fatal Error"*)

Displays *msg* and exits. This writes to standard error under Unix, and pops up a message box under Windows. Used for fatal internal wxWindows errors. See also *wxError* (p. 1279).

Include files

<wx/utils.h>

::wxFindMenuItemId

int wxFindMenuItemId(**wxFrame** *frame, **const wxString&** *menuString*, **const wxString&** *itemString*)

Find a menu item identifier associated with the given frame's menu bar.

Include files

<wx/utils.h>

::wxFindWindowByLabel

wxWindow * wxFindWindowByLabel(**const wxString&** *label*, **wxWindow** **parent=NULL*)

Find a window by its label. Depending on the type of window, the label may be a window title or panel item label. If *parent* is NULL, the search will start from all top-level frames and dialog boxes; if non-NULL, the search will be limited to the given window hierarchy. The search is recursive in both cases.

Include files

<wx/utils.h>

::wxFindWindowByName

wxWindow * wxFindWindowByName(**const wxString&** *name*, **wxWindow** **parent=NULL*)

Find a window by its name (as given in a window constructor or **Create** function call). If *parent* is NULL, the search will start from all top-level frames and dialog boxes; if non-NULL, the search will be limited to the given window hierarchy. The search is recursive in both cases.

If no such named window is found, **wxFindWindowByLabel** is called.

Include files

<wx/utils.h>

::wxGetActiveWindow

wxWindow * wxGetActiveWindow()

Gets the currently active window (Windows only).

Include files

<wx/windows.h>

::wxGetDisplayName

wxString **wxGetDisplayName** ()

Under X only, returns the current display name. See also *wxSetDisplayName* (p. 1288).

Include files

<wx/utils.h>

::wxGetHomeDir

wxString **wxGetHomeDir**()

Return the (current) user's home directory.

See also

wxGetUserHome (p. 1285)

Include files

<wx/utils.h>

::wxGetFreeMemory

long **wxGetFreeMemory**()

Returns the amount of free memory in bytes under environments which support it, and -1 if not supported. Currently, it is supported only under Windows, Linux and Solaris.

Include files

<wx/utils.h>

::wxGetMousePosition

void **wxGetMousePosition**(**int*** *x*, **int*** *y*)

Returns the mouse position in screen coordinates.

Include files

<wx/utils.h>

::wxGetOsDescription

wxString wxGetOsDescription()

Returns the string containing the description of the current platform in a user-readable form. For example, this function may return strings like `Windows NT Version 4.0` or `Linux 2.2.2 i386`.

See also

::wxGetOsVersion (p. 1283)

Include files

<wx/utils.h>

::wxGetOsVersion

int wxGetOsVersion(**int** **major = NULL*, **int** **minor = NULL*)

Gets operating system version information.

Platform	Return types
Macintosh	Return value is wxMACINTOSH.
GTK	Return value is wxGTK, For GTK 1.0, *major* is 1, *minor* is 0.
Motif	Return value is wxMOTIF_X, *major* is X version, *minor* is X revision.
OS/2	Return value is wxOS2_PM.
Windows 3.1	Return value is wxWINDOWS, *major* is 3, *minor* is 1.
Windows NT/2000	Return value is wxWINDOWS_NT, version is returned in *major* and *minor*
Windows 98	Return value is wxWIN95, *major* is 4, *minor* is 1 or greater.
Windows 95	Return value is wxWIN95, *major* is 4, *minor* is 0.
Win32s (Windows 3.1)	Return value is wxWIN32S, *major* is 3, *minor* is 1.
Watcom C++ 386 supervisor mode (Windows 3.1)	Return value is wxWIN386, *major* is 3, *minor* is 1.

See also

::wxGetOsDescription (p. 1283)

Include files

<wx/utils.h>

::wxGetResource

bool wxGetResource (**const wxString&** *section*, **const wxString&** *entry*, **const wxString& ***value*, **const wxString&** *file = NULL*)

bool wxGetResource (**const wxString&** *section*, **const wxString&** *entry*, **float ***value*, **const wxString&** *file = NULL*)

bool wxGetResource (**const wxString&** *section*, **const wxString&** *entry*, **long ***value*, **const wxString&** *file = NULL*)

bool wxGetResource (**const wxString&** *section*, **const wxString&** *entry*, **int ***value*, **const wxString&** *file = NULL*)

Gets a resource value from the resource database (for example, WIN.INI, or .Xdefaults). If *file* is NULL, WIN.INI or .Xdefaults is used, otherwise the specified file is used.

Under X, if an application class (wxApp::GetClassName) has been defined, it is appended to the string /usr/lib/X11/app-defaults/ to try to find an applications default file when merging all resource databases.

The reason for passing the result in an argument is that it can be convenient to define a default value, which gets overridden if the value exists in the resource file. It saves a separate test for that resource's existence, and it also allows the overloading of the function for different types.

See also *wxWriteResource* (p. 1290), *wxConfigBase* (p. 162).

Include files

<wx/utils.h>

::wxGetUserId

bool wxGetUserId(**const wxString&** *buf*, **int** *bufSize*)

Copies the user's login identity (such as "jacs") into the buffer *buf*, of maximum size *bufSize*, returning TRUE if successful. Under Windows, this returns "user".

Include files

<wx/utils.h>

::wxGetUserHome

const wxChar * wxGetUserHome(**const wxString&** *user = ""*)

Returns the home directory for the given user. If the username is empty (default value), this function behaves like *wxGetHomeDir* (p. 1282).

Include files

<wx/utils.h>

::wxGetUserName

bool wxGetUserName(**const wxString&** *buf*, **int** *bufSize*)

Copies the user's name (such as "Julian Smart") into the buffer *buf*, of maximum size *bufSize*, returning TRUE if successful. Under Windows, this returns "unknown".

Include files

<wx/utils.h>

::wxHandleFatalExceptions

bool wxHandleFatalExceptions(**bool** *doIt = TRUE*)

If *doIt* is TRUE, the fatal exceptions (also known as general protection faults under Windows or segmentation violations in the Unix world) will be caught and passed to *wxApp::OnFatalException* (p. 26). By default, i.e. before this function is called, they will be handled in the normal way which usually just means that the application will be terminated. Calling wxHandleFatalExceptions() with *doIt* equal to FALSE will restore this default behaviour.

::wxKill

int wxKill(**long** *pid*, **int** *sig*)

Under Unix (the only supported platform), equivalent to the Unix kill function. Returns 0 on success, -1 on failure.

Tip: sending a signal of 0 to a process returns -1 if the process does not exist. It does not raise a signal in the receiving process.

Include files

<wx/utils.h>

::wxInitAllImageHandlers

void wxInitAllImageHandlers()

Initializes all available image handlers. For a list of available handlers, see *wxImage* (p. 569).

See also

wxImage (p. 569), *wxImageHandler* (p. 583)

::wxIsBusy

bool wxIsBusy()

Returns TRUE if between two *wxBeginBusyCursor* (p. 1275) and *wxEndBusyCursor* (p. 1278) calls.

See also *wxBusyCursor* (p. 88).

Include files

<wx/utils.h>

::wxLoadUserResource

wxString wxLoadUserResource (**const wxString&** *resourceName*, **const wxString&** *resourceType="TEXT"*)

Loads a user-defined Windows resource as a string. If the resource is found, the function creates a new character array and copies the data into it. A pointer to this data is returned. If unsuccessful, NULL is returned.

The resource must be defined in the `.rc` file using the following syntax:

```
myResource TEXT file.ext
```

where `file.ext` is a file that the resource compiler can find.

One use of this is to store `.wxr` files instead of including the data in the C++ file; some compilers cannot cope with the long strings in a `.wxr` file. The resource data can then be parsed using *wxResourceParseString* (p. 1303).

This function is available under Windows only.

Include files

<wx/utils.h>

::wxNow

wxString wxNow()

Returns a string representing the current date and time.

Include files

<wx/utils.h>

::wxPostDelete

void wxPostDelete(**wxObject ****object*)

Tells the system to delete the specified object when all other events have been processed. In some environments, it is necessary to use this instead of deleting a frame directly with the delete operator, because some GUIs will still send events to a deleted window.

Now obsolete: use *wxWindow::Close* (p. 1195) instead.

Include files

<wx/utils.h>

::wxPostEvent

void wxPostEvent(**wxEvtHandler ****dest*, **wxEvent&** *event*)

This function posts the event to the specified *dest* object. The difference between sending an event and posting it is that in the first case the event is processed before the function returns (in wxWindows, event sending is done with *ProcessEvent* (p. 384) function), but in the second, the function returns immediately and the event will be processed sometime later - usually during the next even loop iteration.

Note that a copy of the *event* is made by the function, so the original copy can be deleted as soon as function returns. This function can also be used to send events between different threads safely. As this function makes a copy of the event, the event needs to have a fully implemented Clone() method, which may not be the case for all event in wxWindows.

See also *AddPendingEvent* (p. 381) (which this function uses internally).

Include files

<wx/app.h>

::wxSafeYield

bool wxSafeYield(**wxWindow*** *win = NULL*)

This function is similar to wxYield, except that it disables the user input to all program windows before calling wxYield and re-enables it again afterwards. If *win* is not NULL, this window will remain enabled, allowing the implementation of some limited user interaction.

Returns the result of the call to *::wxYield* (p. 1291).

Include files

<wx/utils.h>

::wxSetDisplayName

void wxSetDisplayName(**const wxString&** *displayName*)

Under X only, sets the current display name. This is the X host and display name such as "colonsay:0.0", and the function indicates which display should be used for creating windows from this point on. Setting the display within an application allows multiple displays to be used.

See also *wxGetDisplayName* (p. 1282).

Include files

<wx/utils.h>

::wxShell

bool wxShell(**const wxString&** *command = NULL*)

Executes a command in an interactive shell window. If no command is specified, then just the shell is spawned.

See also *wxExecute* (p. 1279), *Exec sample* (p. 1330).

Include files

<wx/utils.h>

::wxSleep

void wxSleep(**int** *secs*)

Sleeps for the specified number of seconds.

Include files

<wx/utils.h>

::wxStripMenuCodes

wxString wxStripMenuCodes(**const wxString&** *in*)

void wxStripMenuCodes(**char*** *in*, **char*** *out*)

Strips any menu codes from *in* and places the result in *out* (or returns the new string, in the first form).

Menu codes include & (mark the next character with an underline as a keyboard shortkey in Windows and Motif) and \t (tab in Windows).

Include files

<wx/utils.h>

::wxToLower

char wxToLower(**char** *ch*)

Converts the character to lower case. This is implemented as a macro for efficiency.

Include files

<wx/utils.h>

::wxToUpper

char wxToUpper(**char** *ch*)

Converts the character to upper case. This is implemented as a macro for efficiency.

Include files

<wx/utils.h>

::wxTrace

void wxTrace(**const wxString&** *fmt*, **...**)

Takes printf-style variable argument syntax. Output is directed to the current output stream (see *wxDebugContext* (p. 1365)).

This function is now obsolete, replaced by *Log functions* (p. 1304).

Include files

<wx/memory.h>

::wxTraceLevel

void wxTraceLevel(**int** *level*, **const wxString&** *fmt*, **...**)

Takes printf-style variable argument syntax. Output is directed to the current output stream (see *wxDebugContext* (p. 1365)). The first argument should be the level at which this information is appropriate. It will only be output if the level returned by wxDebugContext::GetLevel is equal to or greater than this value.

This function is now obsolete, replaced by *Log functions* (p. 1304).

Include files

<wx/memory.h>

::wxUsleep

void wxUsleep(**unsigned long** *milliseconds*)

Sleeps for the specified number of milliseconds. Notice that usage of this function is encouraged instead of calling usleep(3) directly because the standard usleep() function is not MT safe.

Include files

<wx/utils.h>

::wxWriteResource

bool wxWriteResource(**const wxString&** *section*, **const wxString&** *entry*, **const wxString&** *value*, **const wxString&** *file = NULL*)

bool wxWriteResource(**const wxString&** *section*, **const wxString&** *entry*, **float** *value*, **const wxString&** *file = NULL*)

bool wxWriteResource(**const wxString&** *section*, **const wxString&** *entry*, **long** *value*, **const wxString&** *file* = *NULL*)

bool wxWriteResource(**const wxString&** *section*, **const wxString&** *entry*, **int** *value*, **const wxString&** *file* = *NULL*)

Writes a resource value into the resource database (for example, WIN.INI, or .Xdefaults). If *file* is NULL, WIN.INI or .Xdefaults is used, otherwise the specified file is used.

Under X, the resource databases are cached until the internal function **wxFlushResources** is called automatically on exit, when all updated resource databases are written to their files.

Note that it is considered bad manners to write to the .Xdefaults file under Unix, although the WIN.INI file is fair game under Windows.

See also *wxGetResource* (p. 1284), *wxConfigBase* (p. 162).

Include files

<wx/utils.h>

::wxYield

bool wxYield()

Yields control to pending messages in the windowing system. This can be useful, for example, when a time-consuming process writes to a text window. Without an occasional yield, the text window will not be updated properly, and on systems with cooperative multitasking, such as Windows 3.1 other processes will not respond.

Caution should be exercised, however, since yielding may allow the user to perform actions which are not compatible with the current task. Disabling menu items or whole menus during processing can avoid unwanted reentrance of code: see *::wxSafeYield* (p. 1288) for a better function.

Note that wxYield will not flush the message logs. This is intentional as calling wxYield is usually done to quickly update the screen and popping up a message box dialog may be undesirable. If you do wish to flush the log messages immediately (otherwise it will be done during the next idle loop iteration), call *wxLog::FlushActive* (p. 658).

Include files

<wx/app.h> or <wx/utils.h>

::wxWakeUpIdle

void wxWakeUpIdle()

This functions wakes up the (internal and platform dependent) idle system, i.e. it will force the system to send an idle event even if the system currently *is* idle and thus would not send any idle event until after some other event would get sent. This is also useful for sending events between two threads and is used by the corresponding functions *::wxPostEvent* (p. 1287) and *wxEvtHandler::AddPendingEvent* (p. 381).

Include files

<wx/app.h>

Macros

These macros are defined in wxWindows.

wxINTXX_SWAP_ALWAYS

wxInt32 wxINT32_SWAP_ALWAYS(**wxInt32** *value*)

wxUint32 wxUINT32_SWAP_ALWAYS(**wxUint32** *value*)

wxInt16 wxINT16_SWAP_ALWAYS(**wxInt16** *value*)

wxUint16 wxUINT16_SWAP_ALWAYS(**wxUint16** *value*)

This macro will swap the bytes of the *value* variable from little endian to big endian or vice versa.

wxINTXX_SWAP_ON_BE

wxInt32 wxINT32_SWAP_ON_BE(**wxInt32** *value*)

wxUint32 wxUINT32_SWAP_ON_BE(**wxUint32** *value*)

wxInt16 wxINT16_SWAP_ON_BE(**wxInt16** *value*)

wxUint16 wxUINT16_SWAP_ON_BE(**wxUint16** *value*)

This macro will swap the bytes of the *value* variable from little endian to big endian or vice versa if the program is compiled on a big-endian architecture (such as Sun work stations). If the program has been compiled on a little-endian architecture, the value will be unchanged.

Use these macros to read data from and write data to a file that stores data in little

endian (Intel i386) format.

wxINTXX_SWAP_ON_LE

wxInt32 wxINT32_SWAP_ON_LE(**wxInt32** *value*)

wxUint32 wxUINT32_SWAP_ON_LE(**wxUint32** *value*)

wxInt16 wxINT16_SWAP_ON_LE(**wxInt16** *value*)

wxUint16 wxUINT16_SWAP_ON_LE(**wxUint16** *value*)

This macro will swap the bytes of the *value* variable from little endian to big endian or vice versa if the program is compiled on a little-endian architecture (such as Intel PCs). If the program has been compiled on a big-endian architecture, the value will be unchanged.

Use these macros to read data from and write data to a file that stores data in big endian format.

CLASSINFO

wxClassInfo * **CLASSINFO**(className)

Returns a pointer to the wxClassInfo object associated with this class.

Include files

<wx/object.h>

DECLARE_ABSTRACT_CLASS

DECLARE_ABSTRACT_CLASS(className)

Used inside a class declaration to declare that the class should be made known to the class hierarchy, but objects of this class cannot be created dynamically. The same as DECLARE_CLASS.

Example:

```
class wxCommand: public wxObject
{
  DECLARE_ABSTRACT_CLASS(wxCommand)

 private:
  ...
 public:
  ...
```

```
};
```

Include files

<wx/object.h>

DECLARE_APP

DECLARE_APP(className)

This is used in headers to create a forward declaration of the wxGetApp function
implemented by IMPLEMENT_APP. It creates the declaration `className&`
`wxGetApp(void).`

Example:

```
DECLARE_APP(MyApp)
```

Include files

<wx/app.h>

DECLARE_CLASS

DECLARE_CLASS(className)

Used inside a class declaration to declare that the class should be made known to the
class hierarchy, but objects of this class cannot be created dynamically. The same as
DECLARE_ABSTRACT_CLASS.

Include files

<wx/object.h>

DECLARE_DYNAMIC_CLASS

DECLARE_DYNAMIC_CLASS(className)

Used inside a class declaration to declare that the objects of this class should be
dynamically creatable from run-time type information.

Example:

```
class wxFrame: public wxWindow
{
  DECLARE_DYNAMIC_CLASS(wxFrame)

 private:
```

```
  const wxString\& frameTitle;
 public:
  ...
};
```

Include files

<wx/object.h>

IMPLEMENT_ABSTRACT_CLASS

IMPLEMENT_ABSTRACT_CLASS(className, baseClassName)

Used in a C++ implementation file to complete the declaration of a class that has run-time type information. The same as IMPLEMENT_CLASS.

Example:

```
IMPLEMENT_ABSTRACT_CLASS(wxCommand, wxObject)

wxCommand::wxCommand(void)
{
...
}
```

Include files

<wx/object.h>

IMPLEMENT_ABSTRACT_CLASS2

IMPLEMENT_ABSTRACT_CLASS2(className, baseClassName1, baseClassName2)

Used in a C++ implementation file to complete the declaration of a class that has run-time type information and two base classes. The same as IMPLEMENT_CLASS2.

Include files

<wx/object.h>

IMPLEMENT_APP

IMPLEMENT_APP(className)

This is used in the application class implementation file to make the application class known to wxWindows for dynamic construction. You use this instead of

Old form:

```
MyApp myApp;
```

New form:

```
IMPLEMENT_APP(MyApp)
```

See also *DECLARE_APP* (p. 1294).

Include files

<wx/app.h>

IMPLEMENT_CLASS

IMPLEMENT_CLASS(className, baseClassName)

Used in a C++ implementation file to complete the declaration of a class that has run-time type information. The same as IMPLEMENT_ABSTRACT_CLASS.

Include files

<wx/object.h>

IMPLEMENT_CLASS2

IMPLEMENT_CLASS2(className, baseClassName1, baseClassName2)

Used in a C++ implementation file to complete the declaration of a class that has run-time type information and two base classes. The same as IMPLEMENT_ABSTRACT_CLASS2.

Include files

<wx/object.h>

IMPLEMENT_DYNAMIC_CLASS

IMPLEMENT_DYNAMIC_CLASS(className, baseClassName)

Used in a C++ implementation file to complete the declaration of a class that has run-time type information, and whose instances can be created dynamically.

Example:

```
IMPLEMENT_DYNAMIC_CLASS(wxFrame, wxWindow)

wxFrame::wxFrame(void)
```

```
{
...
}
```

Include files

<wx/object.h>

IMPLEMENT_DYNAMIC_CLASS2

IMPLEMENT_DYNAMIC_CLASS2(className, baseClassName1, baseClassName2)

Used in a C++ implementation file to complete the declaration of a class that has run-time type information, and whose instances can be created dynamically. Use this for classes derived from two base classes.

Include files

<wx/object.h>

wxBITMAP

wxBITMAP(bitmapName)

This macro loads a bitmap from either application resources (on the platforms for which they exist, i.e. Windows and OS2) or from an XPM file. It allows to avoid using `#ifdef`s when creating bitmaps.

See also

Bitmaps and icons overview (p. 1397), *wxICON* (p. 1298)

Include files

<wx/gdicmn.h>

wxConstCast

wxConstCast(ptr, classname)

This macro expands into `const_cast<classname *>(ptr)` if the compiler supports *const_cast* or into an old, C-style cast, otherwise.

See also

wxDynamicCast (p. 1298)
wxStaticCast (p. 1299)

WXDEBUG_NEW

WXDEBUG_NEW(arg)

This is defined in debug mode to be call the redefined new operator with filename and line number arguments. The definition is:

```
#define WXDEBUG_NEW new(__FILE__,__LINE__)
```

In non-debug mode, this is defined as the normal new operator.

Include files

<wx/object.h>

wxDynamicCast

wxDynamicCast(ptr, classname)

This macro returns the pointer *ptr* cast to the type *classname ** if the pointer is of this type (the check is done during the run-time) or NULL otherwise. Usage of this macro is preferred over obsoleted wxObject::IsKindOf() function.

The *ptr* argument may be NULL, in which case NULL will be returned.

Example:

```
wxWindow *win = wxWindow::FindFocus();
wxTextCtrl *text = wxDynamicCast(win, wxTextCtrl);
if ( text )
{
    // a text control has the focus...
}
else
{
    // no window has the focus or it is not a text control
}
```

See also

RTTI overview (p. 1337)
wxConstCast (p. 1297)
wxStatiicCast (p. 1299)

wxICON

wxICON(iconName)

This macro loads an icon from either application resources (on the platforms for which they exist, i.e. Windows and OS2) or from an XPM file. It allows to avoid using `#ifdef`s when creating icons.

See also

Bitmaps and icons overview (p. 1397), *wxBITMAP* (p. 1297)

Include files

<wx/gdicmn.h>

wxStaticCast

wxStaticCast(ptr, classname)

This macro checks that the cast is valid in debug mode (an assert failure will result if `wxDynamicCast(ptr, classname) == NULL`) and then returns the result of executing an equivalent of `static_cast<classname *>(ptr)`.

wxDynamicCast (p. 1298)
wxConstCast (p. 1297)

WXTRACE

Include files

<wx/object.h>

WXTRACE(formatString, ...)

Calls wxTrace with printf-style variable argument syntax. Output is directed to the current output stream (see *wxDebugContext* (p. 1365)).

This macro is now obsolete, replaced by *Log functions* (p. 1304).

Include files

<wx/memory.h>

WXTRACELEVEL

WXTRACELEVEL(level, formatString, ...)

Calls wxTraceLevel with printf-style variable argument syntax. Output is directed to the current output stream (see *wxDebugContext* (p. 1365)). The first argument should be the

level at which this information is appropriate. It will only be output if the level returned by wxDebugContext::GetLevel is equal to or greater than this value.

This function is now obsolete, replaced by *Log functions* (p. 1304).

Include files

<wx/memory.h>

wxWindows resource functions

wxWindows resource system (p. 1388)

This section details functions for manipulating wxWindows (.WXR) resource files and loading user interface elements from resources.

> Please note that this use of the word 'resource' is different from that used when talking about initialisation file resource reading and writing, using such functions as wxWriteResource and wxGetResource. It is just an unfortunate clash of terminology.

For an overview of the wxWindows resource mechanism, see *the wxWindows resource system* (p. 1388).

See also *wxWindow::LoadFromResource* (p. 1209) for loading from resource data.

::wxResourceAddIdentifier

bool wxResourceAddIdentifier(**const wxString&** *name*, **int** *value*)

Used for associating a name with an integer identifier (equivalent to dynamically #defining a name to an integer). Unlikely to be used by an application except perhaps for implementing resource functionality for interpreted languages.

::wxResourceClear

void wxResourceClear ()

Clears the wxWindows resource table.

::wxResourceCreateBitmap

wxBitmap * **wxResourceCreateBitmap**(**const wxString&** *resource*)

Creates a new bitmap from a file, static data, or Windows resource, given a valid wxWindows bitmap resource identifier. For example, if the .WXR file contains the following:

```
static const wxString\& project_resource = "bitmap(name =
'project_resource',\
  bitmap = ['project', wxBITMAP_TYPE_BMP_RESOURCE, 'WINDOWS'],\
  bitmap = ['project.xpm', wxBITMAP_TYPE_XPM, 'X']).";
```

then this function can be called as follows:

```
  wxBitmap *bitmap  = wxResourceCreateBitmap("project_resource");
```

::wxResourceCreateIcon

wxIcon * wxResourceCreateIcon(**const wxString&** *resource*)

Creates a new icon from a file, static data, or Windows resource, given a valid wxWindows icon resource identifier. For example, if the .WXR file contains the following:

```
static const wxString\& project_resource = "icon(name =
'project_resource',\
  icon = ['project', wxBITMAP_TYPE_ICO_RESOURCE, 'WINDOWS'],\
  icon = ['project', wxBITMAP_TYPE_XBM_DATA, 'X']).";
```

then this function can be called as follows:

```
  wxIcon *icon = wxResourceCreateIcon("project_resource");
```

::wxResourceCreateMenuBar

wxMenuBar * wxResourceCreateMenuBar(**const wxString&** *resource*)

Creates a new menu bar given a valid wxWindows menubar resource identifier. For example, if the .WXR file contains the following:

```
static const wxString\& menuBar11 = "menu(name = 'menuBar11',\
  menu = \
  [\
    ['&File', 1, '', \
      ['&Open File', 2, 'Open a file'],\
      ['&Save File', 3, 'Save a file'],\
      [],\
      ['E&xit', 4, 'Exit program']\
    ],\
    ['&Help', 5, '', \
      ['&About', 6, 'About this program']\
    ]\
  ]).";
```

then this function can be called as follows:

```
wxMenuBar *menuBar = wxResourceCreateMenuBar("menuBar11");
```

::wxResourceGetIdentifier

int wxResourceGetIdentifier(**const wxString&** *name*)

Used for retrieving the integer value associated with an identifier. A zero value indicates that the identifier was not found.

See *wxResourceAddIdentifier* (p. 1300).

::wxResourceParseData

bool wxResourceParseData(**const wxString&** *resource*, **wxResourceTable** **table* = *NULL*)

Parses a string containing one or more wxWindows resource objects. If the resource objects are global static data that are included into the C++ program, then this function must be called for each variable containing the resource data, to make it known to wxWindows.

resource should contain data in the following form:

```
dialog(name = 'dialog1',
  style = 'wxCAPTION | wxDEFAULT_DIALOG_STYLE',
  title = 'Test dialog box',
  x = 312, y = 234, width = 400, height = 300,
  modal = 0,
  control = [1000, wxStaticBox, 'Groupbox', '0', 'group6', 5, 4, 380,
262,
     [11, 'wxSWISS', 'wxNORMAL', 'wxNORMAL', 0]],
  control = [1001, wxTextCtrl, '', 'wxTE_MULTILINE', 'text3',
     156, 126, 200, 70, 'wxWindows is a multi-platform, GUI toolkit.',
     [11, 'wxSWISS', 'wxNORMAL', 'wxNORMAL', 0],
     [11, 'wxSWISS', 'wxNORMAL', 'wxNORMAL', 0]]).
```

This function will typically be used after including a `.wxr` file into a C++ program as follows:

```
#include "dialog1.wxr"
```

Each of the contained resources will declare a new C++ variable, and each of these variables should be passed to wxResourceParseData.

::wxResourceParseFile

bool wxResourceParseFile(**const wxString&** *filename*, **wxResourceTable** **table* =

NULL)

Parses a file containing one or more wxWindows resource objects in C++-compatible syntax. Use this function to dynamically load wxWindows resource data.

::wxResourceParseString

bool wxResourceParseString(**char*** *s*, **wxResourceTable** *table = *NULL*)

Parses a string containing one or more wxWindows resource objects. If the resource objects are global static data that are included into the C++ program, then this function must be called for each variable containing the resource data, to make it known to wxWindows.

resource should contain data with the following form:

```
dialog(name = 'dialog1',
  style = 'wxCAPTION | wxDEFAULT_DIALOG_STYLE',
  title = 'Test dialog box',
  x = 312, y = 234, width = 400, height = 300,
  modal = 0,
  control = [1000, wxStaticBox, 'Groupbox', '0', 'group6', 5, 4, 380,
262,
      [11, 'wxSWISS', 'wxNORMAL', 'wxNORMAL', 0]],
  control = [1001, wxTextCtrl, '', 'wxTE_MULTILINE', 'text3',
      156, 126, 200, 70, 'wxWindows is a multi-platform, GUI toolkit.',
      [11, 'wxSWISS', 'wxNORMAL', 'wxNORMAL', 0],
      [11, 'wxSWISS', 'wxNORMAL', 'wxNORMAL', 0]]).
```

This function will typically be used after calling *wxLoadUserResource* (p. 1286) to load an entire `.wxr file` into a string.

::wxResourceRegisterBitmapData

bool wxResourceRegisterBitmapData(**const wxString&** *name*, **char*** *xbm_data*, **int** *width*,**int** *height*, **wxResourceTable** *table = *NULL*)

bool wxResourceRegisterBitmapData(**const wxString&** *name*, **char**** *xpm_data*)

Makes #included XBM or XPM bitmap data known to the wxWindows resource system. This is required if other resources will use the bitmap data, since otherwise there is no connection between names used in resources, and the global bitmap data.

::wxResourceRegisterIconData

Another name for *wxResourceRegisterBitmapData* (p. 1303).

Log functions

These functions provide a variety of logging functions: see *Log classes overview* (p. 1360) for further information. The functions use (implicitly) the currently active log target, so their descriptions here may not apply if the log target is not the standard one (installed by wxWindows in the beginning of the program).

Include files

<wx/log.h>

::wxLogError

void wxLogError(**const char*** *formatString*, **...**)

The function to use for error messages, i.e. the messages that must be shown to the user. The default processing is to pop up a message box to inform the user about it.

::wxLogFatalError

void wxLogFatalError(**const char*** *formatString*, **...**)

Like *wxLogError* (p. 1304), but also terminates the program with the exit code 3. Using *abort()* standard function also terminates the program with this exit code.

::wxLogWarning

void wxLogWarning(**const char*** *formatString*, **...**)

For warnings - they are also normally shown to the user, but don't interrupt the program work.

::wxLogMessage

void wxLogMessage(**const char*** *formatString*, **...**)

for all normal, informational messages. They also appear in a message box by default (but it can be changed). Notice that the standard behaviour is to not show informational messages if there are any errors later - the logic being that the later error messages make the informational messages preceding them meaningless.

::wxLogVerbose

void wxLogVerbose(**const char*** *formatString*, **...**)

For verbose output. Normally, it is suppressed, but might be activated if the user wishes to know more details about the program progress (another, but possibly confusing name for the same function is **wxLogInfo**).

::wxLogStatus

void wxLogStatus(**wxFrame ****frame*, **const char*** *formatString*, **...**)

void wxLogStatus(**const char*** *formatString*, **...**)

Messages logged by this function will appear in the statusbar of the *frame* or of the top level application window by default (i.e. when using the second version of the function).

If the target frame doesn't have a statusbar, the message will be lost.

::wxLogSysError

void wxLogSysError(**const char*** *formatString*, **...**)

Mostly used by wxWindows itself, but might be handy for logging errors after system call (API function) failure. It logs the specified message text as well as the last system error code (*errno* or *::GetLastError()* depending on the platform) and the corresponding error message. The second form of this function takes the error code explicitly as the first argument.

See also

wxSysErrorCode (p. 1306), *wxSysErrorMsg* (p. 1306)

::wxLogDebug

void wxLogDebug(**const char*** *formatString*, **...**)

The right function for debug output. It only does anything at all in the debug mode (when the preprocessor symbol __WXDEBUG__ is defined) and expands to nothing in release mode (otherwise).

::wxLogTrace

void wxLogTrace(**const char*** *formatString*, **...**)

void wxLogTrace(**const char ****mask*, **const char ****formatString, **...**)

void wxLogTrace(**wxTraceMask** *mask*, **const char ****formatString*, **...**)

As **wxLogDebug**, trace functions only do something in debug build and expand to nothing in the release one. The reason for making it a separate function from it is that usually there are a lot of trace messages, so it might make sense to separate them from other debug messages.

The trace messages also usually can be separated into different categories and the second and third versions of this function only log the message if the *mask* which it has is currently enabled in *wxLog* (p. 655). This allows to selectively trace only some operations and not others by changing the value of the trace mask (possible during the run-time).

For the second function (taking a string mask), the message is logged only if the mask has been previously enabled by the call to *AddTraceMask* (p. 657). The predefined string trace masks used by wxWindows are:

- wxTRACE_MemAlloc: trace memory allocation (new/delete)
- wxTRACE_Messages: trace window messages/X callbacks
- wxTRACE_ResAlloc: trace GDI resource allocation
- wxTRACE_RefCount: trace various ref counting operations
- wxTRACE_OleCalls: trace OLE method calls (Win32 only)

The third version of the function only logs the message if all the bit corresponding to the *mask* are set in the wxLog trace mask which can be set by *SetTraceMask* (p. 659). This version is less flexible than the previous one because it doesn't allow defining the user trace masks easily - this is why it is deprecated in favour of using string trace masks.

- wxTraceMemAlloc: trace memory allocation (new/delete)
- wxTraceMessages: trace window messages/X callbacks
- wxTraceResAlloc: trace GDI resource allocation
- wxTraceRefCount: trace various ref counting operations
- wxTraceOleCalls: trace OLE method calls (Win32 only)

::wxSysErrorCode

unsigned long wxSysErrorCode()

Returns the error code from the last system call. This function uses `errno` on Unix platforms and `GetLastError` under Win32.

See also

wxSysErrorMsg (p. 1306), *wxLogSysError* (p. 1305)

::wxSysErrorMsg

const wxChar * wxSysErrorMsg(**unsigned long** *errCode = 0*)

Returns the error message corresponding to the given system error code. If *errCode* is 0 (default), the last error code (as returned by *wxSysErrorCode* (p. 1306)) is used.

See also

wxSysErrorCode (p. 1306), *wxLogSysError* (p. 1305)

Time functions

The functions in this section deal with getting the current time and starting/stopping the global timers. Please note that the timer functions are deprecated because they work with one global timer only and *wxTimer* (p. 1118) and/or *wxStopWatch* (p. 1002) classes should be used instead. For retrieving the current time, you may also use *wxDateTime::Now* (p. 226) or *wxDateTime::UNow* (p. 227) methods.

::wxGetElapsedTime

long wxGetElapsedTime (**bool** *resetTimer = TRUE*)

Gets the time in milliseconds since the last *::wxStartTimer* (p. 1308).

If *resetTimer* is TRUE (the default), the timer is reset to zero by this call.

See also *wxTimer* (p. 1118).

Include files

<wx/timer.h>

::wxGetLocalTime

long wxGetLocalTime ()

Returns the number of seconds since local time 00:00:00 Jan 1st 1970.

See also

wxDateTime::Now (p. 226)

Include files

<wx/timer.h>

::wxGetLocalTimeMillis

wxLongLone wxGetLocalTimeMillis()

Returns the number of milliseconds since local time 00:00:00 Jan 1st 1970.

See also

wxDateTime::Now (p. 226),
wxLongLone (p. 660)

Include files

<wx/timer.h>

::wxGetUTCTime

long wxGetUTCTime ()

Returns the number of seconds since GMT 00:00:00 Jan 1st 1970.

See also

wxDateTime::Now (p. 226)

Include files

<wx/timer.h>

::wxStartTimer

void wxStartTimer()

Starts a stopwatch; use *::wxGetElapsedTime* (p. 1307) to get the elapsed time.

See also *wxTimer* (p. 1118).

Include files

<wx/timer.h>

Debugging macros and functions

Useful macros and functions for error checking and defensive programming. ASSERTs are only compiled if __WXDEBUG__ is defined, whereas CHECK macros stay in release builds.

Include files

<wx/debug.h>

::wxOnAssert

void wxOnAssert(**const char*** *fileName*, **int** *lineNumber*, **const char*** *msg = NULL*)

This function may be redefined to do something non trivial and is called whenever one of debugging macros fails (i.e. condition is false in an assertion).

wxASSERT

wxASSERT(*condition*)

Assert macro. An error message will be generated if the condition is FALSE in debug mode, but nothing will be done in the release build.

Please note that the condition in wxASSERT() should have no side effects because it will not be executed in release mode at all.

See also: *wxASSERT_MSG* (p. 1309)

wxASSERT_MSG

wxASSERT_MSG(*condition*, *msg*)

Assert macro with message. An error message will be generated if the condition is FALSE.

See also: *wxASSERT* (p. 1309)

wxFAIL

wxFAIL()

Will always generate an assert error if this code is reached (in debug mode).

See also: *wxFAIL_MSG* (p. 1309)

wxFAIL_MSG

wxFAIL_MSG(*msg*)

Will always generate an assert error with specified message if this code is reached (in debug mode).

This macro is useful for marking unreachable" code areas, for example it may be used in the "default:" branch of a switch statement if all possible cases are processed above.

See also: *wxFAIL* (p. 1309)

wxCHECK

 wxCHECK(*condition*, *retValue*)

Checks that the condition is true, returns with the given return value if not (FAILs in debug mode). This check is done even in release mode.

wxCHECK_MSG

 wxCHECK_MSG(*condition*, *retValue*, *msg*)

Checks that the condition is true, returns with the given return value if not (FAILs in debug mode). This check is done even in release mode.

This macro may be only used in non void functions, see also *wxCHECK_RET* (p. 1310).

wxCHECK_RET

 wxCHECK_RET(*condition*, *msg*)

Checks that the condition is true, and returns if not (FAILs with given error message in debug mode). This check is done even in release mode.

This macro should be used in void functions instead of *wxCHECK_MSG* (p. 1310).

wxCHECK2

 wxCHECK2(*condition*, *operation*)

Checks that the condition is true and *wxFAIL* (p. 1309) and execute *operation* if it is not. This is a generalisation of *wxCHECK* (p. 1310) and may be used when something else than just returning from the function must be done when the *condition* is false.

This check is done even in release mode.

wxCHECK2_MSG

 wxCHECK2(*condition*, *operation*, *msg*)

This is the same as *wxCHECK2* (p. 1310), but *wxFAIL_MSG* (p. 1309) with the specified *msg* is called instead of wxFAIL() if the *condition* is false.

Keycodes

Keypresses are represented by an enumerated type, wxKeyCode. The possible values are the ASCII character codes, plus the following:

```
WXK_BACK    = 8
WXK_TAB     = 9
WXK_RETURN  = 13
WXK_ESCAPE  = 27
WXK_SPACE   = 32
WXK_DELETE  = 127

WXK_START   = 300
WXK_LBUTTON
WXK_RBUTTON
WXK_CANCEL
WXK_MBUTTON
WXK_CLEAR
WXK_SHIFT
WXK_CONTROL
WXK_MENU
WXK_PAUSE
WXK_CAPITAL
WXK_PRIOR
WXK_NEXT
WXK_END
WXK_HOME
WXK_LEFT
WXK_UP
WXK_RIGHT
WXK_DOWN
WXK_SELECT
WXK_PRINT
WXK_EXECUTE
WXK_SNAPSHOT
WXK_INSERT
WXK_HELP
WXK_NUMPAD0
WXK_NUMPAD1
WXK_NUMPAD2
WXK_NUMPAD3
WXK_NUMPAD4
WXK_NUMPAD5
WXK_NUMPAD6
WXK_NUMPAD7
WXK_NUMPAD8
WXK_NUMPAD9
WXK_MULTIPLY
```

```
WXK_ADD
WXK_SEPARATOR
WXK_SUBTRACT
WXK_DECIMAL
WXK_DIVIDE
WXK_F1
WXK_F2
WXK_F3
WXK_F4
WXK_F5
WXK_F6
WXK_F7
WXK_F8
WXK_F9
WXK_F10
WXK_F11
WXK_F12
WXK_F13
WXK_F14
WXK_F15
WXK_F16
WXK_F17
WXK_F18
WXK_F19
WXK_F20
WXK_F21
WXK_F22
WXK_F23
WXK_F24
WXK_NUMLOCK
WXK_SCROLL
```

Chapter 7 Classes by category

A classification of wxWindows classes by category.

Managed windows

There are several types of window that are directly controlled by the window manager (such as MS Windows, or the Motif Window Manager). Frames may contain windows, and dialog boxes may directly contain controls.

wxDialog (p. 312)	Dialog box
wxFrame (p. 454)	Normal frame
wxMDIParentFrame (p. 675)	MDI parent frame
wxMDIChildFrame (p. 670)	MDI child frame
wxMiniFrame (p. 721)	A frame with a small title bar
wxWizard (p. 1241)	A wizard dialog.
wxTabbedDialog (p. 1044)	Tabbed dialog (deprecated, use wxNotebook instead)

See also **Common dialogs**.

Miscellaneous windows

The following are a variety of classes that are derived from wxWindow.

wxPanel (p. 769)	A window whose colour changes according to current user settings
wxScrolledWindow (p. 916)	Window with automatically managed scrollbars
wxGrid (p. 481)	A grid (table) window
wxSplitterWindow (p. 978)	Window which can be split vertically or horizontally
wxStatusBar (p. 996)	Implements the status bar on a frame
wxToolBar (p. 1123)	Toolbar class
wxNotebook (p. 741)	Notebook class
wxPlotWindow (p. 786)	A class to display data.
wxSashWindow (p. 901)	Window with four optional sashes that can be dragged
wxSashLayoutWindow (p. 898)	Window that can be involved in an IDE-like layout arrangement
wxWizardPage (p. 1245)	A base class for the page in wizard dialog.
wxWizardPageSimple (p. 1246)	A page in wizard dialog.

Common dialogs

Overview (p. 1407)

Common dialogs are ready-made dialog classes which are frequently used in an application.

wxDialog (p. 312)	Base class for common dialogs
wxColourDialog (p. 142)	Colour chooser dialog
wxDirDialog (p. 327)	Directory selector dialog
wxFileDialog (p. 410)	File selector dialog
wxMultipleChoiceDialog (p. 734)	Dialog to get one or more selections from a list
wxSingleChoiceDialog (p. 924)	Dialog to get a single selection from a list and return the string
wxTextEntryDialog (p. 1094)	Dialog to get a single line of text from the user
wxFontDialog (p. 447)	Font chooser dialog
wxPageSetupDialog (p. 762)	Standard page setup dialog
wxPrintDialog (p. 802)	Standard print dialog
wxPageSetupDialog (p. 762)	Standard page setup dialog
wxMessageDialog (p. 713)	Simple message box dialog
wxWizard (p. 1241)	A wizard dialog.

Controls

Typically, these are small windows which provide interaction with the user. Controls that are not static can have *validators* (p. 1172) associated with them.

wxControl (p. 177)	The base class for controls
wxButton (p. 89)	Push button control, displaying text
wxBitmapButton (p. 70)	Push button control, displaying a bitmap
wxCalendarCtrl (p. 95)	Date picker control
wxCheckBox (p. 108)	Checkbox control
wxCheckListBox (p. 111)	A listbox with a checkbox to the left of each item
wxChoice (p. 113)	Choice control (a combobox without the editable area)
wxComboBox (p. 144)	A choice with an editable area
wxGauge (p. 473)	A control to represent a varying quantity, such as time remaining
wxStaticBox (p. 989)	A static, or group box for visually grouping related controls
wxListBox (p. 625)	A list of strings for single or multiple selection
wxListCtrl (p. 634)	A control for displaying lists of strings and/or icons, plus a multicolumn report view
wxTabCtrl (p. 1058)	Manages several tabs
wxTextCtrl (p. 1075)	Single or multiline text editing control
wxTreeCtrl (p. 1140)	Tree (hierarchy) control
wxScrollBar (p. 907)	Scrollbar control
wxSpinButton (p. 967)	A spin or 'up-down' control
wxSpinCtrl (p. 971)	A spin control - i.e. spin button and text control
wxStaticText (p. 994)	One or more lines of non-editable text
wxStaticBitmap (p. 987)	A control to display a bitmap
wxRadioBox (p. 863)	A group of radio buttons
wxRadioButton (p. 869)	A round button to be used with others in a mutually exclusive way
wxSlider (p. 934)	A slider that can be dragged by the user

Menus

wxMenu (p. 687)   Displays a series of menu items for selection
wxMenuBar (p. 697)   Contains a series of menus for use with a frame
wxMenuItem (p. 706)   Represents a single menu item

Window layout

There are two different systems for layouting windows (and dialogs in particular). One is based upon so-called sizers and it requires less typing, thinking and calculating and will in almost all cases produce dialogs looking equally well on all platforms, the other is based on so-called constraints and allows for more detailed layouts.

These are the classes relevant to the sizer-based layout.

wxSizer (p. 929)   Abstract base class
wxGridSizer (p. 495)   A sizer for laying out windows in a grid with all fields having
                                 the same size
wxFlexGridSizer (p. 434)   A sizer for laying out windows in a flexible grid
wxBoxSizer (p. 77)   A sizer for laying out windows in a row or column
wxStaticBoxSizer (p. 991)   Same as wxBoxSizer, but with surrounding static box
wxNotebookSizer (p. 738)   Sizer to use with the wxNotebook control.

Overview (p. 1384) over the constraints-based layout.

These are the classes relevant to constraints-based window layout.

wxIndividualLayoutConstraint (p. 591)   Represents a single constraint dimension
wxLayoutConstraints (p. 616) Represents the constraints for a window class

Device contexts

Overview (p. 1400)

Device contexts are surfaces that may be drawn on, and provide an abstraction that allows parameterisation of your drawing code by passing different device contexts.

wxClientDC (p. 121)   A device context to access the client area outside **OnPaint**
                                 events
wxPaintDC (p. 763)   A device context to access the client area inside **OnPaint**
                                 events
wxWindowDC (p. 1240)   A device context to access the non-client area
wxScreenDC (p. 906)   A device context to access the entire screen
wxDC (p. 282)   The device context base class
wxMemoryDC (p. 682)   A device context for drawing into bitmaps
wxMetafileDC (p. 716)   A device context for drawing into metafiles
wxPostScriptDC (p. 791)   A device context for drawing into PostScript files
wxPrinterDC (p. 810)   A device context for drawing to printers

Graphics device interface

Bitmaps overview (p. 1397)

These classes are related to drawing on device contexts and windows.

wxColour (p. 136)	Represents the red, blue and green elements of a colour
wxBitmap (p. 54)	Represents a bitmap
wxBrush (p. 80)	Used for filling areas on a device context
wxBrushList (p. 86)	The list of previously-created brushes
wxCursor (p. 184)	A small, transparent bitmap representing the cursor
wxFont (p. 437)	Represents fonts
wxFontList (p. 450)	The list of previously-created fonts
wxIcon (p. 562)	A small, transparent bitmap for assigning to frames and drawing on device contexts
wxImage (p. 569)	A platform-independent image class
wxImageList (p. 587)	A list of images, used with some controls
wxMask (p. 663)	Represents a mask to be used with a bitmap for transparent drawing
wxPen (p. 775)	Used for drawing lines on a device context
wxPenList (p. 782)	The list of previously-created pens
wxPalette (p. 765)	Represents a table of indices into RGB values
wxRegion (p. 890)	Represents a simple or complex region on a window or device context

Events

Overview (p. 1372)

An event object contains information about a specific event. Event handlers (usually member functions) have a single, event argument.

wxActivateEvent (p. 20)	A window or application activation event
wxCalendarEvent (p. 105)	Used with *wxCalendarCtrl* (p. 95)
wxCalculateLayoutEvent (p. 94)	Used to calculate window layout
wxCloseEvent (p. 125)	A close window or end session event
wxCommandEvent (p. 153)	An event from a variety of standard controls
wxDialUpEvent (p. 320)	Event send by *wxDialUpManager* (p. 321)
wxDropFilesEvent (p. 366)	A drop files event
wxEraseEvent (p. 376)	An erase background event
wxEvent (p. 377)	The event base class
wxFocusEvent (p. 436)	A window focus event
wxKeyEvent (p. 610)	A keypress event
wxIdleEvent (p. 560)	An idle event
wxInitDialogEvent (p. 594)	A dialog initialisation event
wxJoystickEvent (p. 607)	A joystick event
wxListEvent (p. 648)	A list control event

Validators

These are the window validators, used for filtering and validating user input.

Data structures

These are the data structure classes supported by wxWindows.

wxRect (p. 873)	A class representing a rectangle
wxRegion (p. 890)	A class representing a region
wxString (p. 1011)	A string class
wxStringList (p. 1035)	A class representing a list of strings
wxStringTokenizer (p. 1037)	A class for interpreting a string as a list of tokens or words
wxRealPoint (p. 872)	Representation of a point using floating point numbers
wxSize (p. 926)	Representation of a size
wxTime (p. 1113)	A class for time manipulation (deprecated in favour of wxDateTime)
wxTimeSpan (p. 1097)	A time interval.
wxVariant (p. 1174)	A class for storing arbitrary types that may change at run-time

Run-time class information system

Overview (p. 1337)

wxWindows supports run-time manipulation of class information, and dynamic creation of objects given class names.

wxClassInfo (p. 119)	Holds run-time class information
wxObject (p. 750)	Root class for classes with run-time information
Macros (p. 1292)	Macros for manipulating run-time information

Debugging features

Overview (p. 1363)

wxWindows supports some aspects of debugging an application through classes, functions and macros.

wxDebugContext (p. 306)	Provides memory-checking facilities
wxLog (p. 655)	Logging facility
Log functions (p. 1304)	Error and warning logging functions
Debugging macros (p. 1308)	Debug macros for assertion and checking
WXDEBUG_NEW (p. 1298)	Use this macro to give further debugging information

Networking classes

wxWindows provides its own classes for socket based networking.

wxDialUpManager (p. 321)	Provides functions to check the status of network connection and to establish one
wxIPV4address (p. 599)	Represents an Internet address
wxSocketBase (p. 943)	Represents a socket base object
wxSocketClient (p. 960)	Represents a socket client
wxSocketServer (p. 964)	Represents a socket server

wxSocketEvent (p. 963)   A socket event
wxFTP (p. 469)   FTP protocol class
wxHTTP (p. 559)   HTTP protocol class
wxURL (p. 1169)   Represents a Universal Resource Locator

Interprocess communication

Overview (p. 1438)

wxWindows provides a simple interprocess communications facilities based on DDE.

wxDDEClient (p. 300)   Represents a client
wxDDEConnection (p. 301)   Represents the connection between a client and a server
wxDDEServer (p. 305)   Represents a server
wxTCPClient (p. 1066)   Represents a client
wxTCPConnection (p. 1068) Represents the connection between a client and a server
wxTCPServer (p. 1072)   Represents a server

Document/view framework

Overview (p. 1411)

wxWindows supports a document/view framework which provides housekeeping for a document-centric application.

wxDocument (p. 353)   Represents a document
wxView (p. 1184)   Represents a view
wxDocTemplate (p. 348)   Manages the relationship between a document class and a view class
wxDocManager (p. 334)   Manages the documents and views in an application
wxDocChildFrame (p. 332)   A child frame for showing a document view
wxDocParentFrame (p. 346) A parent frame to contain views

Printing framework

Overview (p. 1428)

A printing and previewing framework is implemented to make it relatively straightforward to provide document printing facilities.

wxPreviewFrame (p. 794)   Frame for displaying a print preview
wxPreviewCanvas (p. 792)   Canvas for displaying a print preview
wxPreviewControlBar (p. 793)   Standard control bar for a print preview
wxPrintDialog (p. 802)   Standard print dialog
wxPageSetupDialog (p. 762) Standard page setup dialog
wxPrinter (p. 808)   Class representing the printer
wxPrinterDC (p. 810)   Printer device context

wxPrintout (p. 811)   Class representing a particular printout
wxPrintPreview (p. 815)   Class representing a print preview
wxPrintData (p. 796)   Represents information about the document being printed
wxPrintDialogData (p. 803)   Represents information about the print dialog
wxPageSetupDialogData (p. 756)   Represents information about the page setup
                                dialog

Drag and drop and clipboard classes

Drag and drop and clipboard overview (p. 1430)

wxDataObject (p. 197)   Data object class
wxDataFormat (p. 195)   Represents a data format
wxTextDataObject (p. 1088)   Text data object class
wxFileDataObject (p. 1088)   File data object class
wxBitmapDataObject (p. 75)   Bitmap data object class
wxCustomDataObject (p. 182)   Custom data object class
wxClipboard (p. 121)   Clipboard class
wxDropTarget (p. 370)   Drop target class
wxFileDropTarget (p. 414)   File drop target class
wxTextDropTarget (p. 1096)   Text drop target class
wxDropSource (p. 368)   Drop source class

File related classes

wxWindows has several small classes to work with disk files, see *file classes overview* (p. 1358) for more details.

wxDir (p. 325)   Class for enumerating files/subdirectories.
wxFile (p. 398)   Low-level file input/output class.
wxFFile (p. 404)   Another low-level file input/output class.
wxTempFile (p. 1073)   Class to safely replace an existing file
wxTextFile (p. 1100)   Class for working with text files as with arrays of lines

Stream classes

wxWindows has its own set of stream classes, as an alternative to often buggy standard stream libraries, and to provide enhanced functionality.

wxStreamBase (p. 1003)   Stream base class
wxStreamBuffer (p. 1005)   Stream buffer class
wxInputStream (p. 595)   Input stream class
wxOutputStream (p. 755)   Output stream class
wxCountingOutputStream (p. 178)   Stream class for querying what size a stream would
                                have.
wxFilterInputStream (p. 435) Filtered input stream class
wxFilterOutputStream (p. 435)   Filtered output stream class

wxBufferedInputStream (p. 92) Buffered input stream class
wxBufferedOutputStream (p. 93) Buffered output stream class
wxMemoryInputStream (p. 685) Memory input stream class
wxMemoryOutputStream (p. 686) Memory output stream class
wxDataInputStream (p. 203) Platform-independent binary data input stream class
wxDataOutputStream (p. 205) Platform-independent binary data output stream class
wxTextInputStream (p. 1090) Platform-independent text data input stream class
wxTextOutputStream (p. 1092) Platform-independent text data output stream class
wxFileInputStream (p. 418) File input stream class
wxFileOutputStream (p. 420) File output stream class
wxFFileInputStream (p. 421) Another file input stream class
wxFFileOutputStream (p. 423) Another file output stream class
wxZlibInputStream (p. 1249) Zlib (compression) input stream class
wxZlibOutputStream (p. 1249) Zlib (compression) output stream class
wxZipInputStream (p. 1248) Input stream for reading from ZIP archives
wxSocketInputStream (p. 966) Socket input stream class
wxSocketOutputStream (p. 967) Socket output stream class

Threading classes

Multithreading overview(p. 1429)

wxWindows provides a set of classes to make use of the native thread capabilities of the various platforms.

wxThread (p. 1106) Thread class
wxMutex (p. 735) Mutex class
wxMutexLocker (p. 737) Mutex locker utility class
wxCriticalSection (p. 179) Critical section class
wxCriticalSectionLocker (p. 180) Critical section locker utility class
wxCondition (p. 161) Condition class

HTML classes

wxWindows provides a set of classes to display text in HTML format. These class include a help system based on the HTML widget.

wxHtmlHelpController (p. 522) HTML help controller class
wxHtmlWindow (p. 546) HTML window class
wxHtmlEasyPrinting (p. 518) Simple class for printing HTML
wxHtmlPrintout (p. 537) Generic HTML wxPrintout class
wxHtmlParser (p. 533) Generic HTML parser class
wxHtmlTagHandler (p. 542) HTML tag handler, pluginable into wxHtmlParser
wxHtmlWinParser (p. 552) HTML parser class for wxHtmlWindow
wxHtmlWinTagHandler (p. 558) HTML tag handler, pluginable into wxHtmlWinParser

Virtual file system classes

wxWindows provides a set of classes that implement an extensible virtual file system, used internally by the HTML classes.

wxFSFile (p. 467)   Represents a file in the virtual file system
wxFileSystem (p. 425)   Main interface for the virtual file system
wxFileSystemHandler (p. 427)   Class used to announce file system type

Miscellaneous

wxApp (p. 21)   Application class
wxCaret (p. 105)   A caret (cursor) object
wxCmdLineParser (p. 127)   Command line parser class
wxConfig (p. 162)   Classes for configuration reading/writing (using either INI files or registry)
wxDllLoader (p. 330)   Class to work with shared libraries.
wxHelpController (p. 498)   Family of classes for controlling help windows
wxLayoutAlgorithm (p. 614)   An alternative window layout facility
wxProcess (p. 820)   Process class
wxTimer (p. 1118)   Timer class
wxStopWatch (p. 1002)   Stop watch class
wxMimeTypesManager (p. 717)   MIME-types manager class
wxSystemSettings (p. 1040) System settings class
wxAcceleratorTable (p. 17)   Accelerator table
wxAutomationObject (p. 50) OLE automation class
wxFontMapper (p. 451)   Font mapping, finding suitable font for given encoding
wxEncodingConverter (p. 373)   Encoding conversions
wxCalendarDateAttr (p. 101) Used with *wxCalendarCtrl* (p. 95)

Database classes

wxWindows provides a set of classes for accessing Microsoft's ODBC (Open Database Connectivity) product, also available for Unix and Linux. The new version by Remstar is documented here:

wxDb (p. 244)   Database class
wxDbColFor (p. 267)   International formatting
wxDbCollnf (p. 267)   Information about a columns definition
wxDbTable (p. 268)   Access to rows of data in a table
wxDbTableInf (p. 282)   Information describing the table
wxDbInf (p. 267)   Database connection

Chapter 8 Topic overviews

This chapter contains a selection of topic overviews, first things first:

Notes on using the reference

In the descriptions of the wxWindows classes and their member functions, note that descriptions of inherited member functions are not duplicated in derived classes unless their behaviour is different. So in using a class such as wxScrolledWindow, be aware that wxWindow functions may be relevant.

Note also that arguments with default values may be omitted from a function call, for brevity. Size and position arguments may usually be given a value of -1 (the default), in which case wxWindows will choose a suitable value.

Most strings are returned as wxString objects. However, for remaining char * return values, the strings are allocated and deallocated by wxWindows. Therefore, return values should always be copied for long-term use, especially since the same buffer is often used by wxWindows.

The member functions are given in alphabetical order except for constructors and destructors which appear first.

Writing a wxWindows application: a rough guide

To set a wxWindows application going, you will need to derive a *wxApp* (p. 21) class and override *wxApp::OnInit* (p. 28).

An application must have a top-level *wxFrame* (p. 454) or *wxDialog* (p. 312) window. Each frame may contain one or more instances of classes such as *wxPanel* (p. 769), *wxSplitterWindow* (p. 978) or other windows and controls.

A frame can have a *wxMenuBar* (p. 697), a *wxToolBar* (p. 1123), a status line, and a *wxIcon* (p. 562) for when the frame is iconized.

A *wxPanel* (p. 769) is used to place controls (classes derived from *wxControl* (p. 177)) which are used for user interaction. Examples of controls are *wxButton* (p. 89), *wxCheckBox* (p. 108), *wxChoice* (p. 113), *wxListBox* (p. 625), *wxRadioBox* (p. 863), *wxSlider* (p. 934).

Instances of *wxDialog* (p. 312) can also be used for controls and they have the advantage of not requiring a separate frame.

Instead of creating a dialog box and populating it with items, it is possible to choose one of the convenient common dialog classes, such as *wxMessageDialog* (p. 713) and *wxFileDialog* (p. 410).

You never draw directly onto a window - you use a *device context* (DC). *wxDC* (p. 282) is the base for *wxClientDC* (p. 121), *wxPaintDC* (p. 763), *wxMemoryDC* (p. 682), *wxPostScriptDC* (p. 791), *wxMemoryDC* (p. 682), *wxMetafileDC* (p. 716) and *wxPrinterDC* (p. 810). If your drawing functions have **wxDC** as a parameter, you can pass any of these DCs to the function, and thus use the same code to draw to several different devices. You can draw using the member functions of **wxDC**, such as *wxDC::DrawLine* (p. 287) and *wxDC::DrawText* (p. 289). Control colour on a window (*wxColour* (p. 136)) with brushes (*wxBrush* (p. 80)) and pens (*wxPen* (p. 775)).

To intercept events, you add a DECLARE_EVENT_TABLE macro to the window class declaration, and put a BEGIN_EVENT_TABLE ... END_EVENT_TABLE block in the implementation file. Between these macros, you add event macros which map the event (such as a mouse click) to a member function. These might override predefined event handlers such as *wxWindow::OnChar* (p. 1211) and *wxWindow::OnMouseEvent* (p. 1219).

Most modern applications will have an on-line, hypertext help system; for this, you need wxHelp and the *wxHelpController* (p. 498) class to control wxHelp.

GUI applications aren't all graphical wizardry. List and hash table needs are catered for by *wxList* (p. 619), *wxStringList* (p. 1035) and *wxHashTable* (p. 495). You will undoubtedly need some platform-independent *file functions* (p. 1253), and you may find it handy to maintain and search a list of paths using *wxPathList* (p. 773). There's a *miscellany* (p. 1274) of operating system and other functions.

See also *Classes by Category* (p. 1313) for a list of classes.

wxWindows "Hello World"

As many people have requested a mini-sample to be published here so that some quick judgments concerning syntax and basic principles can be made, you can now look at wxWindows' "Hello World":

You have to include wxWindows' header files, of course. This can be done on a file by file basis (such as #include "wx/window.h") or using one global include (#include "wx/wx.h"). This is also useful on platforms which support precompiled headers such as all major compilers on the Windows platform.

```
//
// file name: hworld.cpp
//
//    purpose: wxWindows "Hello world"
//
```

```
// For compilers that support precompilation, includes "wx/wx.h".
#include "wx/wxprec.h"

#ifdef __BORLANDC__
    #pragma hdrstop
#endif

#ifndef WX_PRECOMP
    #include "wx/wx.h"
#endif
```

Practically every app should define a new class derived from wxApp. By overriding wxApp's OnInit() the program can be initialized, e.g. by creating a new main window.

```
class MyApp: public wxApp
{
    virtual bool OnInit();
};
```

The main window is created by deriving a class from wxFrame and giving it a menu and a status bar in its constructor. Also, any class that wishes to respond to any "event" (such as mouse clicks or messages from the menu or a button) must declare an event table using the macro below. Finally, the way to react to such events must be done in "handlers". In our sample, we react to two menu items, one for "Quit" and one for displaying an "About" window. These handlers should not be virtual.

```
class MyFrame: public wxFrame
{
public:
    MyFrame(const wxString& title, const wxPoint& pos, const wxSize&
size);

    void OnQuit(wxCommandEvent& event);
    void OnAbout(wxCommandEvent& event);

private:
    DECLARE_EVENT_TABLE()
};
```

In order to be able to react to a menu command, it must be given a unique identifier such as a const or an enum.

```
enum
{
    ID_Quit = 1,
    ID_About,
};
```

We then proceed to actually implement an event table in which the events are routed to their respective handler functions in the class MyFrame. There are predefined macros for routing all common events, ranging from the selection of a list box entry to a resize event when a user resizes a window on the screen. If -1 is given as the ID, the given handler will be invoked for any event of the specified type, so that you could add just one

entry in the event table for all menu commands or all button commands etc. The origin of the event can still be distinguished in the event handler as the (only) parameter in an event handler is a reference to a wxEvent object, which holds various information about the event (such as the ID of and a pointer to the class, which emitted the event).

```
BEGIN_EVENT_TABLE(MyFrame, wxFrame)
    EVT_MENU(ID_Quit,  MyFrame::OnQuit)
    EVT_MENU(ID_About, MyFrame::OnAbout)
END_EVENT_TABLE()
```

As in all programs there must be a "main" function. Under wxWindows main is implemented using this macro, which creates an application instance and starts the program.

```
IMPLEMENT_APP(MyApp)
```

As mentioned above, wxApp::OnInit() is called upon startup and should be used to initialize the program, maybe showing a "splash screen" and creating the main window (or several). The frame should get a title bar text ("Hello World") and a position and start-up size. One frame can also be declared to be the top window. Returning TRUE indicates a successful initialization.

```
bool MyApp::OnInit()
{
    MyFrame *frame = new MyFrame( "Hello World", wxPoint(50,50),
wxSize(450,340) );
    frame->Show( TRUE );
    SetTopWindow( frame );
    return TRUE;
}
```

In the constructor of the main window (or later on) we create a menu with two menu items as well as a status bar to be shown at the bottom of the main window. Both have to be "announced" to the frame with respective calls.

```
MyFrame::MyFrame(const wxString& title, const wxPoint& pos, const
wxSize& size)
       : wxFrame((wxFrame *)NULL, -1, title, pos, size)
{
    wxMenu *menuFile = new wxMenu;

    menuFile->Append( ID_About, "&About..." );
    menuFile->AppendSeparator();
    menuFile->Append( ID_Quit, "E&xit" );

    wxMenuBar *menuBar = new wxMenuBar;
    menuBar->Append( menuFile, "&File" );

    SetMenuBar( menuBar );

    CreateStatusBar();
    SetStatusText( "Welcome to wxWindows!" );
}
```

Here are the actual event handlers. MyFrame::OnQuit() closes the main window by calling Close(). The parameter TRUE indicates that other windows have no veto power such as after asking "Do you really want to close?". If there is no other main window left, the application will quit.

```
void MyFrame::OnQuit(wxCommandEvent& WXUNUSED(event))
{
    Close( TRUE );
}
```

MyFrame::OnAbout() will display a small window with some text in it. In this case a typical "About" window with information about the program.

```
void MyFrame::OnAbout(wxCommandEvent& WXUNUSED(event))
{
    wxMessageBox( "This is a wxWindows' Hello world sample",
                  "About Hello World", wxOK | wxICON_INFORMATION );
}
```

wxWindows samples

Probably the best way to learn wxWindows is by reading the source of some 50+ samples provided with it. Many aspects of wxWindows programming can be learnt from them, but sometimes it is not simple to just choose the right sample to look at. This overview aims at describing what each sample does/demonstrates to make it easier to find the relevant one if a simple grep through all sources didn't help. They also provide some notes about using the samples and what features of wxWindows are they supposed to test.

There are currently more than 50 different samples as part of wxWindows and this list is not complete. You should start your tour of wxWindows with the *minimal sample* (p. 1328) which is the wxWindows version of "Hello, world!". It shows the basic structure of wxWindows program and is the most commented sample of all - looking at its source code is recommended.

The next most useful sample is probably the *controls* (p. 1328) one which shows many of wxWindows standard controls, such as buttons, listboxes, checkboxes, comboboxes etc.

Other, more complicated controls, have their own samples. In this category you may find the following samples showing the corresponding controls:

wxCalendarCtrl (p. 1328)   Calendar a.k.a. date picker control
wxListCtrl (p. 1332)   List view control
wxTreeCtrl (p. 1335)   Tree view control
wxGrid (p. 1331)   Grid control

Finally, it might be helpful to do a search in the entire sample directory if you can't find the sample you showing the control you are interested in by name. Most of wxWindows classes, occur in at least one of the samples.

Minimal sample

The minimal sample is what most people will know under the term Hello World, i.e. a minimal program that doesn't demonstrate anything apart from what is needed to write a program that will display a "hello" dialog. This is usually a good starting point for learning how to use wxWindows.

Calendar sample

This font shows the *calendar control* (p. 95) in action. It shows how to configure the control (see the different options in the calendar menu) and also how to process the notifications from it.

Checklist sample

This sample demonstrates the use of the *wxCheckListBox* (p. 111)class intercepting check, select and double click events. It also tests the use of various methods modifying the control, such as by deleting items from it or inserting new once (these functions are actually implemented in the parent class *wxListBox* (p. 625) so the sample tests that class as well). The layout of the dialog is created using a *wxBoxSizer* (p. 77)demonstrating a simple dynamic layout.

Config sample

This sample demonstrates the *wxConfig* (p. 162) classes in a platform indenpedent way, i.e. it uses text based files to store a given configuration under Unix and uses the Registry under Windows.

See *wxConfig overview*(p. 1366) for the descriptions of all features of this class.

Controls sample

The controls sample is the main test program for most simple controls used in wxWindows. The sample tests their basic functionality, events, placement, modification in terms of colour and font as well as the possibility to change the controls programmatically, such as adding item to a list box etc. Apart from that, the sample uses a *wxNotebook* (p. 741) and tests most features of this special control (using bitmap in the tabs, using *wxSizers* (p. 929) and *constraints* (p. 616) within notebook pages, advancing pages programmatically and vetoing a page change by intercepting the *wxNotebookEvent* (p. 747).

The various controls tested are listed here:

wxButton (p. 89)	Push button control, displaying text
wxBitmapButton (p. 70)	Push button control, displaying a bitmap
wxCheckBox (p. 108)	Checkbox control
wxChoice (p. 113)	Choice control (a combobox without the editable area)
wxComboBox (p. 144)	A choice with an editable area
wxGauge (p. 473)	A control to represent a varying quantity, such as time remaining
wxStaticBox (p. 989)	A static, or group box for visually grouping related controls
wxListBox (p. 625)	A list of strings for single or multiple selection
wxSpinCtrl	A spin ctrl with a text field and a 'up-down' control
wxSpinButton (p. 967)	A spin or 'up-down' control
wxStaticText (p. 994)	One or more lines of non-editable text
wxStaticBitmap (p. 987)	A control to display a bitmap
wxRadioBox (p. 863)	A group of radio buttons
wxRadioButton (p. 869)	A round button to be used with others in a mutually exclusive way
wxSlider (p. 934)	A slider that can be dragged by the user

Database sample

The database sample is a small test program showing how to use the ODBC classes written by Remstar Intl. These classes are documented in a separate manual available from the wxWindows homepage. Obviously, this sample requires a database with ODBC support to be correctly installed on your system.

Dialogs sample

This sample shows how to use the common dialogs available from wxWindows. These dialogs are described in details in the *Common dialogs overview* (p. 1407).

Dialup sample

This sample shows *wxDialUpManager* (p. 321) class. It displays in the status bar the information gathered through itsi nterface: in particular, the current connection status (online or offline) and whether the connection is permanent (in which case a string 'LAN' appears in the thrid status bar field - but note that you may have be on a LAN not connected to the Internet, in which case you will not see this) or not.

Using the menu entries, you may also dial or hang up the line if you have a modem attached and (this only makes sense for Windows) list the available connections.

Dynamic sample

This sample is a very small sample that demonstrates the use of the *wxEvtHandler::Connect* (p. 382) method. This method should be used whenever it is not known at compile time, which control will receive which event or which controls are actually going to be in a dialog or frame. This is most typically the case for any scripting language that would work as a wrapper for wxWindows or programs where forms or similar datagrams can be created by the uses.

Exec sample

The exec sample demonstrates the *wxExecute* (p. 1279) and *wxShell* (p. 1288) functions. Both of them are used to execute the external programs and the sample shows how to do this synchronously (waiting until the program terminates) or asynchronously (notification will come later).

It also shows how to capture the output of the child process in both synchronous and asynchronous cases.

Scroll subwindow sample

This sample demonstrates the use of the *wxScrolledWindow* (p. 916) class including placing subwindows into it and drawing simple graphics. It uses the *SetTargetWindow* (p. 923) method and thus the effect of scrolling does not show in the scrolled window itself, but in one of its subwindows.

Additionally, this samples demonstrates how to optimize drawing operations in wxWindows, in particular using the *wxWindow::IsExposed* (p. 1208) method with the aim to prevent unnecessary drawing in the window and thus reducing or removing flicker on screen.

Rotate sample

This is a simple example which demonstrates how to rotate an image with the *wxImage::Rotate* (p. 580) method. The rotation can be done without interpolation (left mouse button) which will be faster, or with interpolation (right mouse button) which is slower but gives better results.

Font sample

The font sample demonstrates *wxFont* (p. 437), *wxFontEnumerator* (p. 448) and *wxFontMapper* (p. 451) classes. It allows you to see the fonts available (to wxWindows) on the computer and shows all characters of the chosen font as well.

DnD sample

This sample shows both clipboard and drag and drop in action. It is quite non trivial and

may be safely used as a basis for implementing the clipboard and drag and drop operations in a real-life program.

When you run the sample, its screen is split in several parts. On the top, there are two listboxes which show the standard derivations of *wxDropTarget* (p. 370): *wxTextDropTarget* (p. 1096) and *wxFileDropTarget* (p. 414).

The middle of the sample window is taken by the log window which shows what is going on (of course, this only works in debug builds) and may be helpful to see the sequence of steps of data transfer.

Finally, the last part is used for dragging text from it to either one of the listboxes (only one will accept it) or another application. The last functionality available from the main frame is to paste a bitmap from the clipboard (or, in the case of Windows version, also a metafile) - it will be shown in a new frame.

So far, everything we mentioned was implemented with minimal amount of code using standard wxWindows classes. The more advanced features are demonstrated if you create a shape frame from the main frame menu. A shape is a geometric object which has a position, size and color. It models some application-specific data in this sample. A shape object supports its own private *wxDataFormat* (p. 195) which means that you may cut and paste it or drag and drop (between one and the same or different shapes) from one sample instance to another (or the same). However, chances are that no other program supports this format and so shapes can also be rendered as bitmaps which allows them to be pasted/dropped in many other applications (and, under Windows, also as metafiles which are supported by most of Windows programs as well - try Write/Wordpad, for example).

Take a look at DnDShapeDataObject class to see how you may use *wxDataObject* (p. 197) to achieve this.

Grid sample

TODO.

HTML samples

Eight HTML samples (you can find them in directory `samples/html`) cover all features of HTML sub-library.

Test demonstrates how to create *wxHtmlWindow* (p. 546) and also shows most of supported HTML tags.

Widget shows how you can embed ordinary controls or windows within HTML page. It also nicely explains how to write new tag handlers and extend the library to work with unsupported tags.

About may give you an idea how to write good-looking about boxes.

Zip demonstrates use of virtual file systems in wxHTML. The zip archives handler (ships with wxWindows) allows you to access HTML pages stored in compressed archive as if they were ordinary files.

Virtual is yet another virtual file systems demo. This one generates pages at run-time. You may find it useful if you need to display some reports in your application.

Printing explains use of *wxHtmlEasyPrinting* (p. 518) class which serves as as-simple-as-possible interface for printing HTML documents without much work. In fact, only few function calls are sufficient.

Help and **Helpview** are variations on displaying HTML help (compatible with MS HTML Help Workshop). *Help* shows how to embed *wxHtmlHelpController* (p. 522) in your application while *Helpview* is simple tool that only pops up help window and displays help books given at command line.

Image sample

The image sample demonstrates the use of the *wxImage* (p. 569) class and shows how to download images in a variety of formats, currently PNG, GIF, TIFF, JPEG, BMP, PNM and PCX. The top of the sample shows to rectangles, one of which is drawn directly in the window, the other one is drawn into a *wxBitmap* (p. 54), converted to a wxImage, saved as a PNG image and then reloaded from the PNG file again so that conversions between wxImage and wxBitmap as well as loading and save PNG files are tested.

At the bottom of the main frame is a test for using a monochrome bitmap by drawing into a *wxMemoryDC* (p. 682). The bitmap is then drawn specifying the foreground and background colours with *wxDC::SetTextForeground* (p. 299) and *wxDC::SetTextBackground* (p. 299) (on the left). The bitmap is then converted to a wxImage and the foreground colour (black) is replaced with red using *wxImage::Replace* (p. 580).

Layout sample

The layout sample demonstrates the two different layout systems offered by wxWindows. When starting the program, you will see a frame with some controls and some graphics. The controls will change their size whenever you resize the entire frame and the exact behaviour of the size changes is determined using the *wxLayoutConstraints* (p. 616) class. See also the *overview* (p. 1384) and the *wxIndividualLayoutConstraint* (p. 591) class for further information.

The menu in this sample offers two more tests, one showing how to use a *wxBoxSizer* (p. 77) in a simple dialog and the other one showing how to use sizers in connection with a *wxNotebook* (p. 741) class. See also *wxNotebookSizer* (p. 738) and *wxSizer* (p. 929).

Listctrl sample

This sample shows *wxListCtrl* (p. 634) control. Different modes supported by the control (list, icons, small icons, report) may be chosen from the menu.

The sample also provides some timings for adding/deleting/sorting a lot of (several thousands) controls into the control.

Sockets sample

The sockets sample demonstrates how to use the communication facilities provided by *wxSocket* (p. 943). There are two different applications in this sample: a server, which is implemented using a *wxSocketServer* (p. 964) object, and a client, which is implemented as a *wxSocketClient* (p. 960).

The server binds to the local address, using TCP port number 3000, sets up an event handler to be notified of incoming connection requests (**wxSOCKET_CONNECTION** events), and stands there, waiting for clients (*listening* in the socket parlance). For each accepted connection, a new *wxSocketBase* (p. 943) object is created. These socket objects are independent from the server that created them, so they set up their own event handler, and then request to be notified of **wxSOCKET_INPUT** (incoming data) or **wxSOCKET_LOST** (connection closed at the remote end) events. In the sample, the event handler is the same for all connections; to find out which socket the event is addressed to, the *GetSocket* (p. 964) function is used.

Although it might take some time to get used to the event-oriented system upon which wxSocket is built, the benefits are many. See, for example, that the server application, while being single-threaded (and of course without using fork() or ugly select() loops) can handle an arbitrary number of connections.

The client starts up unconnected, so you can use the Connect... option to specify the address of the server you are going to connect to (the TCP port number is hard-coded as 3000). Once connected, a number of tests are possible. Currently, three tests are implemented. They show how to use the basic IO calls in *wxSocketBase* (p. 943), such as *Read* (p. 955), *Write* (p. 959), *ReadMsg* (p. 955) and *WriteMsg* (p. 960), and how to set up the correct IO flags depending on what you are going to do. See the comments in the code for more information. Note that because both clients and connection objects in the server set up an event handler to catch **wxSOCKET_LOST** events, each one is immediately notified if the other end closes the connection.

There is also an URL test which shows how to use the *wxURL* (p. 1169) class to fetch data from a given URL.

The sockets sample is work in progress. Some things to do:

- More tests for basic socket functionality.
- More tests for protocol classes (wxProtocol and its descendants).
- Tests for the recently added (and still in alpha stage) datagram sockets.
- New samples which actually do something useful (suggestions accepted).

Toolbar sample

The toolbar sample shows the *wxToolBar* (p. 1123) class in action.

The following things are demonstrated:

- Creating the toolbar using *wxToolBar::AddTool* (p. 1126) and *wxToolBar::AddControl* (p. 1126): see MyApp::InitToolbar in the sample.
- Using EVT_UPDATE_UI handler for automatically enabling/disabling toolbar buttons without having to explicitly call EnableTool. This is done in MyFrame::OnUpdateCopyAndCut.
- Using *wxToolBar::DeleteTool* (p. 1128) and *wxToolBar::InsertTool* (p. 1133) to dynamically update the toolbar.

Treectrl sample

This sample demonstrates using *wxTreeCtrl* (p. 1140) class. Here you may see how to process various notification messages sent by this control and also when they occur (by looking at the messages in the text control in the bottom part of the frame).

Adding, inserting and deleting items and branches from the tree as well as sorting (in default alphabetical order as well as in custom one) is demonstrated here as well - try the corresponding menu entries.

Wizard sample

This sample shows so-called wizard dialog (implemented using *wxWizard* (p. 1241) and related classes). It shows almost all features supported:

- Using bitmaps with the wizard and changing them depending on the page shown (notice that wxValidationPage in the sample has a different image from the other ones)
- Using *TransferDataFromWindow* (p. 1238) to verify that the data entered is correct before passing to the next page (done in wxValidationPage which forces the user to check a checkbox before continuing).
- Using more elaborated techniques to allow returning to the previous page, but not continuing to the next one or vice versa (in wxRadioboxPage)
- This (wxRadioboxPage) page also shows how the page may process Cancel button itself instead of relying on the wizard parent to do it.
- Normally, the order of the pages in the wizard is known at compile-time, but sometimes it depends on the user choices: wxCheckboxPage shows how to dynamically decide which page to display next (see also *wxWizardPage* (p. 1245))

wxApp overview

Classes: *wxApp* (p. 21)

A wxWindows application does not have a *main* procedure; the equivalent is the *OnInit* (p. 28) member defined for a class derived from wxApp. *OnInit* will usually create a top window as a bare minimum.

Unlike in earlier versions of wxWindows, OnInit does not return a frame. Instead it returns a boolean value which indicates whether processing should continue (TRUE) or not (FALSE). You call *wxApp::SetTopWindow* (p. 31) to let wxWindows know about the top window.

Note that the program's command line arguments, represented by *argc* and *argv*, are available from within wxApp member functions.

An application closes by destroying all windows. Because all frames must be destroyed for the application to exit, it is advisable to use parent frames wherever possible when creating new frames, so that deleting the top level frame will automatically delete child frames. The alternative is to explicitly delete child frames in the top-level frame's *wxWindow::OnCloseWindow* (p. 1213) handler.

In emergencies the *wxExit* (p. 1280) function can be called to kill the application.

An example of defining an application follows:

```
class DerivedApp : public wxApp
{
public:
  virtual bool OnInit();
};

IMPLEMENT_APP(DerivedApp)

bool DerivedApp::OnInit()
{
  wxFrame *the_frame = new wxFrame(NULL, argv[0]);
  ...
  SetTopWindow(the_frame);

  return TRUE;
}
```

Note the use of IMPLEMENT_APP(appClass), which allows wxWindows to dynamically create an instance of the application object at the appropriate point in wxWindows initialization. Previous versions of wxWindows used to rely on the creation of a global application object, but this is no longer recommended, because required global initialization may not have been performed at application object construction time.

You can also use DECLARE_APP(appClass) in a header file to declare the wxGetApp function which returns a reference to the application object.

Run time class information overview

Classes: *wxObject* (p. 750), *wxClassInfo* (p. 119).

One of the failings of C++ used to be that no run-time information was provided about a class and its position in the inheritance hierarchy. Another, which still persists, is that instances of a class cannot be created just by knowing the name of a class, which makes facilities such as persistent storage hard to implement.

Most C++ GUI frameworks overcome these limitations by means of a set of macros and functions and wxWindows is no exception. As it originated before the addition of RTTI to the standard C++ and as support for it still missing from some (albeit old) compilers, wxWindows doesn't (yet) use it, but provides its own macro-based RTTI system.

In the future, the standard C++ RTTI will be used though and you're encouraged to use whenever possible *wxDynamicCast()* (p. 1298) macro which, for the implementations that support it, is defined just as dynamic_cast<> and uses wxWindows RTTI for all the others. This macro is limited to wxWindows classes only and only works with pointers (unlike the real dynamic_cast<> which also accepts references).

Each class that you wish to be known the type system should have a macro such as DECLARE_DYNAMIC_CLASS just inside the class declaration. The macro IMPLEMENT_DYNAMIC_CLASS should be in the implementation file. Note that these are entirely optional; use them if you wish to check object types, or create instances of classes using the class name. However, it is good to get into the habit of adding these macros for all classes.

Variations on these *macros* (p. 1292) are used for multiple inheritance, and abstract classes that cannot be instantiated dynamically or otherwise.

DECLARE_DYNAMIC_CLASS inserts a static wxClassInfo declaration into the class, initialized by IMPLEMENT_DYNAMIC_CLASS. When initialized, the wxClassInfo object inserts itself into a linked list (accessed through wxClassInfo::first and wxClassInfo::next pointers). The linked list is fully created by the time all global initialisation is done.

IMPLEMENT_DYNAMIC_CLASS is a macro that not only initialises the static wxClassInfo member, but defines a global function capable of creating a dynamic object of the class in question. A pointer to this function is stored in wxClassInfo, and is used when an object should be created dynamically.

wxObject::IsKindOf (p. 752) uses the linked list of wxClassInfo. It takes a wxClassInfo argument, so use CLASSINFO(className) to return an appropriate wxClassInfo pointer to use in this function.

The function *wxCreateDynamicObject* (p. 1276) can be used to construct a new object of a given type, by supplying a string name. If you have a pointer to the wxClassInfo object

instead, then you can simply call wxClassInfo::CreateObject.

wxClassInfo

Run time class information overview (p. 1337)

Class: *wxClassInfo* (p. 119)

This class stores meta-information about classes. An application may use macros such as DECLARE_DYNAMIC_CLASS and IMPLEMENT_DYNAMIC_CLASS to record run-time information about a class, including:

- its position in the inheritance hierarchy;
- the base class name(s) (up to two base classes are permitted);
- a string representation of the class name;
- a function that can be called to construct an instance of this class.

The DECLARE_... macros declare a static wxClassInfo variable in a class, which is initialized by macros of the form IMPLEMENT_... in the implementation C++ file. Classes whose instances may be constructed dynamically are given a global constructor function which returns a new object.

You can get the wxClassInfo for a class by using the CLASSINFO macro, e.g. CLASSINFO(wxFrame). You can get the wxClassInfo for an object using wxObject::GetClassInfo.

See also *wxObject* (p. 750) and *wxCreateDynamicObject* (p. 1276).

Example

In a header file frame.h:

```
class wxFrame : public wxWindow
{
DECLARE_DYNAMIC_CLASS(wxFrame)

private:
    wxString m_title;

public:
    ...
};
```

In a C++ file frame.cpp:

```
IMPLEMENT_DYNAMIC_CLASS(wxFrame, wxWindow)

wxFrame::wxFrame()
{
...
```

}

wxString overview

Classes: *wxString* (p. 1011), *wxArrayString* (p. 44), *wxStringTokenizer* (p. 1037)

Introduction

wxString is a class which represents a character string of arbitrary length (limited by *MAX_INT* which is usually 2147483647 on 32 bit machines) and containing arbitrary characters. The ASCII NUL character is allowed, although care should be taken when passing strings containing it to other functions.

wxString only works with ASCII (8 bit characters) strings as of this release, but support for UNICODE (16 but characters) is planned for the next one.

This class has all the standard operations you can expect to find in a string class: dynamic memory management (string extends to accommodate new characters), construction from other strings, C strings and characters, assignment operators, access to individual characters, string concatenation and comparison, substring extraction, case conversion, trimming and padding (with spaces), searching and replacing and both C-like *Printf()* (p. 1028) and stream-like insertion functions as well as much more - see *wxString* (p. 1011) for a list of all functions.

Comparison of wxString to other string classes

The advantages of using a special string class instead of working directly with C strings are so obvious that there is a huge number of such classes available. The most important advantage is the need to always remember to allocate/free memory for C strings; working with fixed size buffers almost inevitably leads to buffer overflows. At last, C++ has a standard string class (std::string). So why the need for wxString?

There are several advantages:

1. **Efficiency** This class was made to be as efficient as possible: both in terms of size (each wxString objects takes exactly the same space as a *char ** pointer, sing *reference counting* (p. 1342)) and speed. It also provides performance *statistics gathering code* (p. 1342) which may be enabled to fine tune the memory allocation strategy for your particular application - and the gain might be quite big.
2. **Compatibility** This class tries to combine almost full compatibility with the old wxWindows 1.xx wxString class, some reminiscence to MFC CString class and 90% of the functionality of std::string class.
3. **Rich set of functions** Some of the functions present in wxString are very useful but don't exist in most of other string classes: for example, *AfterFirst* (p. 1020),

       BeforeLast (p. 1021), *operator<<* (p. 1033) or *Printf* (p. 1028). Of course, all the standard string operations are supported as well.

4. **UNICODE** In this release, wxString only supports *construction* from a UNICODE string, but in the next one it will be capable of also storing its internal data in either ASCII or UNICODE format.

5. **Used by wxWindows** And, of course, this class is used everywhere inside wxWindows so there is no performance loss which would result from conversions of objects of any other string class (including std::string) to wxString internally by wxWindows.

However, there are several problems as well. The most important one is probably that there are often several functions to do exactly the same thing: for example, to get the length of the string either one of length(), *Len()* (p. 1026) or *Length()* (p. 1026) may be used. The first function, as almost all the other functions in lowercase, is std::string compatible. The second one is "native" wxString version and the last one is wxWindows 1.xx way. So the question is: which one is better to use? And the answer is that:

The usage of std::string compatible functions is strongly advised! It will both make your code more familiar to other C++ programmers (who are supposed to have knowledge of std::string but not of wxString), let you reuse the same code in both wxWindows and other programs (by just typedefing wxString as std::string when used outside wxWindows) and by staying compatible with future versions of wxWindows which will probably start using std::string sooner or later too.

In the situations where there is no corresponding std::string function, please try to use the new wxString methods and not the old wxWindows 1.xx variants which are deprecated and may disappear in future versions.

Some advice about using wxString

Probably the main trap with using this class is the implicit conversion operator to *const char **. It is advised that you use *c_str()* (p. 1021)instead to clearly indicate when the conversion is done. Specifically, the danger of this implicit conversion may be seen in the following code fragment:

```
// this function converts the input string to uppercase, output it to
the screen
// and returns the result
const char *SayHELLO(const wxString& input)
{
    wxString output = input.Upper();

    printf("Hello, %s!\n", output);

    return output;
}
```

There are two nasty bugs in these three lines. First of them is in the call to the *printf()* function. Although the implicit conversion to C strings is applied automatically by the compiler in the case of

```
    puts(output);
```

because the argument of *puts()* is known to be of the type *const char **, this is **not** done for *printf()* which is a function with variable number of arguments (and whose arguments are of unknown types). So this call may do anything at all (including displaying the correct string on screen), although the most likely result is a program crash. The solution is to use *c_str()* (p. 1021): just replace this line with

```
    printf("Hello, %s!\n", output.c_str());
```

The second bug is that returning *output* doesn't work. The implicit cast is used again, so the code compiles, but as it returns a pointer to a buffer belonging to a local variable which is deleted as soon as the function exits, its contents is totally arbitrary. The solution to this problem is also easy: just make the function return wxString instead of a C string.

This leads us to the following general advice: all functions taking string arguments should take *const wxString&* (this makes assignment to the strings inside the function faster because of *reference counting* (p. 1342)) and all functions returning strings should return *wxString* - this makes it safe to return local variables.

Other string related functions and classes

As most programs use character strings, the standard C library provides quite a few functions to work with them. Unfortunately, some of them have rather counter-intuitive behaviour (like strncpy() which doesn't always terminate the resulting string with a NULL) and are in general not very safe (passing NULL to them will probably lead to program crash). Moreover, some very useful functions are not standard at all. This is why in addition to all wxString functions, there are also a few global string functions which try to correct these problems: *IsEmpty()* (p. 1261) verifies whether the string is empty (returning TRUE for NULL pointers), *Strlen()* (p. 1261) also handles NULLs correctly and returns 0 for them and *Stricmp()* (p. 1261) is just a platform-independent version of case-insensitive string comparison function known either as stricmp() or strcasecmp() on different platforms.

The `<wx/string.h>` header also defines *wxSnprintf* (p. 1262) and *wxVsnprintf* (p. 1262) functions which should be used instead of the inherently dangerous standard `sprintf()` and which use `snprintf()` instead which does buffer size checks whenever possible. Of course, you may also use *wxString::Printf* (p. 1028) which is also safe.

There is another class which might be useful when working with wxString: *wxStringTokenizer* (p. 1037). It is helpful when a string must be broken into tokens and replaces the standard C library *strtok()* function.

And the very last string-related class is *wxArrayString* (p. 44): it is just a version of the "template" dynamic array class which is specialized to work with strings. Please note that this class is specially optimized (using its knowledge of the internal structure of wxString) for storing strings and so it is vastly better from a performance point of view than a wxObjectArray of wxStrings.

Reference counting and why you shouldn't care about it

wxString objects use a technique known as *copy on write* (COW). This means that when a string is assigned to another, no copying really takes place: only the reference count on the shared string data is incremented and both strings share the same data.

But as soon as one of the two (or more) strings is modified, the data has to be copied because the changes to one of the strings shouldn't be seen in the others. As data copying only happens when the string is written to, this is known as COW.

What is important to understand is that all this happens absolutely transparently to the class users and that whether a string is shared or not is not seen from the outside of the class - in any case, the result of any operation on it is the same.

Probably the unique case when you might want to think about reference counting is when a string character is taken from a string which is not a constant (or a constant reference). In this case, due to C++ rules, the "read-only" *operator[]* (which is the same as *GetChar()* (p. 1023)) cannot be chosen and the "read/write" *operator[]* (the same as *GetWritableChar()* (p. 1024)) is used instead. As the call to this operator may modify the string, its data is unshared (COW is done) and so if the string was really shared there is some performance loss (both in terms of speed and memory consumption). In the rare cases when this may be important, you might prefer using *GetChar()* (p. 1023) instead of the array subscript operator for this reasons. Please note that *at()* (p. 1016) method has the same problem as the subscript operator in this situation and so using it is not really better. Also note that if all string arguments to your functions are passed as *const wxString&* (see the section *Some advice* (p. 1340)) this situation will almost never arise because for constant references the correct operator is called automatically.

Tuning wxString for your application

Note: this section is strictly about performance issues and is absolutely not necessary to read for using wxString class. Please skip it unless you feel familiar with profilers and relative tools. If you do read it, please also read the preceding section about *reference counting* (p. 1342).

For the performance reasons wxString doesn't allocate exactly the amount of memory needed for each string. Instead, it adds a small amount of space to each allocated block which allows it to not reallocate memory (a relatively expensive operation) too often as when, for example, a string is constructed by subsequently adding one character at a time to it, as for example in:

```
// delete all vowels from the string
wxString DeleteAllVowels(const wxString& original)
{
    wxString result;

    size_t len = original.length();
    for ( size_t n = 0; n < len; n++ )
```

```
    {
        if ( strchr("aeuio", tolower(original[n])) == NULL )
            result += original[n];
    }

    return result;
}
```

This is quite a common situation and not allocating extra memory at all would lead to very bad performance in this case because there would be as many memory (re)allocations as there are consonants in the original string. Allocating too much extra memory would help to improve the speed in this situation, but due to a great number of wxString objects typically used in a program would also increase the memory consumption too much.

The very best solution in precisely this case would be to use *Alloc()* (p. 1019) function to preallocate, for example, len bytes from the beginning - this will lead to exactly one memory allocation being performed (because the result is at most as long as the original string).

However, using Alloc() is tedious and so wxString tries to do its best. The default algorithm assumes that memory allocation is done in granularity of at least 16 bytes (which is the case on almost all of wide-spread platforms) and so nothing is lost if the amount of memory to allocate is rounded up to the next multiple of 16. Like this, no memory is lost and 15 iterations from 16 in the example above won't allocate memory but use the already allocated pool.

The default approach is quite conservative. Allocating more memory may bring important performance benefits for programs using (relatively) few very long strings. The amount of memory allocated is configured by the setting of *EXTRA_ALLOC* in the file string.cpp during compilation (be sure to understand why its default value is what it is before modifying it!). You may try setting it to greater amount (say twice nLen) or to 0 (to see performance degradation which will follow) and analyse the impact of it on your program. If you do it, you will probably find it helpful to also define WXSTRING_STATISTICS symbol which tells the wxString class to collect performance statistics and to show them on stderr on program termination. This will show you the average length of strings your program manipulates, their average initial length and also the percent of times when memory wasn't reallocated when string concatenation was done but the already preallocated memory was used (this value should be about 98% for the default allocation policy, if it is less than 90% you should really consider fine tuning wxString for your application).

It goes without saying that a profiler should be used to measure the precise difference the change to EXTRA_ALLOC makes to your program.

Date and time classes overview

Classes: *wxDateTime* (p. 215), *wxDateSpan* (p. 215), *wxTimeSpan* (p. 1097),

wxCalendarCtrl (p. 95)

Introduction

wxWindows provides a set of powerful classes to work with dates and times. Some of the supported features of *wxDateTime* (p. 215) class are:

Wide range	The range of supported dates goes from about 4714 B.C. to some 480 million years in the future.
Precision	Not using floating point calculations anywhere ensures that the date calculations don't suffer from rounding errors.
Many features	Not only all usual calculations with dates are supported, but also more exotic week and year day calculations, work day testing, standard astronomical functions, conversion to and from strings in either strict or free format.
Efficiency	Objects of wxDateTime are small (8 bytes) and working with them is fast

All date/time classes at a glance

There are 3 main classes declared in `<wx/datetime.h>`: except *wxDateTime* (p. 215) itself which represents an absolute moment in the time, there are also two classes - *wxTimeSpan* (p. 1097) and *wxDateSpan* (p. 215) which represent the intervals of time.

There are also helper classes which are used together with wxDateTime: *wxDateTimeHolidayAuthority* (p. 243) which is used to determine whether a given date is a holiday or not and *wxDateTimeWorkDays* (p. 243) which is a derivation of this class for which (only) Saturdays and Sundays are the holidays. See more about these classes in the discussion of the *holidays* (p. 1347).

Finally, in other parts of this manual you may find mentions of wxDate and wxTime classes. *These classes* (p. 1347) are obsolete and superseded by wxDateTime.

wxDateTime characteristics

wxDateTime (p. 215) stores the time as a signed number of milliseconds since the Epoch which is fixed, by convention, to Jan 1, 1970 - however this is not visible to the class users (in particular, dates prior to the Epoch are handled just as well (or as bad) as the dates after it). But it does mean that the best resolution which can be achieved with this class is 1 millisecond.

The size of wxDateTime object is 8 bytes because it is represented as a 64 bit integer. The resulting range of supported dates is thus approximatively 580 million years, but due

to the current limitations in the Gregorian calendar support, only dates from Nov 24, 4714BC are supported (this is subject to change if there is sufficient interest in doing it).

Finally, the internal representation is time zone independent (always in GMT) and the time zones only come into play when a date is broken into year/month/day components. See more about *timezones* (p. 1346) below.

Currently, the only supported calendar is Gregorian one (which is used even for the dates prior to the historic introduction of this calendar which was first done on Oct 15, 1582 but is, generally speaking, country, and even region, dependent). Future versions will probably have Julian calendar support as well and support for other calendars (Maya, Hebrew, Chinese...) is not ruled out.

Difference between wxDateSpan and wxTimeSpan

While there is only one logical way to represent an absolute moment in the time (and hence only one wxDateTime class), there are at least two methods to describe a time interval.

First, there is the direct and self-explaining way implemented by *wxTimeSpan* (p. 1097): it is just a difference in milliseconds between two moments in the time. Adding and substracting such interval to wxDateTime is always well-defined and is a fast operation.

But in the daily life other, calendar-dependent time interval specifications are used. For example, 'one month later' is commonly used. However, it is clear that this is not the same as wxTimeSpan of 60*60*24*31 seconds because 'one month later' Feb 15 is Mar 15 and not Mar 17 or Mar 16 (depending on whether the year is leap or not).

This is why there is another class for representing such intervals called *wxDateSpan* (p. 215). It handles this sort of operations in the most natural way possible, but note that manipulating with thei ntervals of this kind is not always well-defined. Consider, for example, Jan 31 + '1 month': this will give Feb 28 (or 29), i.e. the last day of February and not the non-existing Feb 31. Of course, this is what is usually wanted, but you still might be surprised to notice that now substracting back the same interval from Feb 28 will result in Jan 28 and **not** Jan 31 we started with!

So, unless you plan to implement some kind of natural language parsing in the program, you should probably use wxTimeSpan instead of wxDateSpan (which is also more efficient). However, wxDateSpan may be very useful in situations when you do need to understand what does 'in a month' mean (of course, it is just `wxDateTime::Now() + wxDateSpan::Month()`).

Date arithmetics

Many different operations may be performed with the dates, however not all of them make sense. For example, multiplying date by a number is an invalid operation, even though multiplying either of time span classes by a number is perfectly valid.

Here is what can be done:

> **Addition**a wxTimeSpan or wxDateSpan can be added
> to wxDateTime resulting in a new wxDateTime
> object and also 2 objects of the same span
> class can be added together giving another
> object of the smae class.
> **Substraction**the same types of operations as above
> are allowed and, additionally, a difference
> between two wxDateTime objects can be taken
> and this will yield wxTimeSpan.
> **Multiplication**a wxTimeSpan or wxDateSpan object
> can be multiplied by an integer number
> resulting in an object of the same type.
> **Unary minus**a wxTimeSpan or wxDateSpan object
> may finally be negated giving an interval of the
> same magnitude but of opposite time direction.

For all these operations there are corresponding global (overloaded) operators and also member functions which are synonyms for them: Add(), Substract() and Multiply(). Unary minus as well as composite assignment operations (like +=) are only implemented as members and Neg() is the synonym for unary minus.

Time zone considerations

Although the time is always stored internally in GMT, you will usually work in the local time zone. Because of this, all wxDateTime constructors and setters which take the broken down date assume that these values are for the local time zone. Thus, `wxDateTime(1, wxDateTime::Jan, 1970)` will not correspond to the wxDateTime Epoch unless you happen to live in the UK.

All methods returning the date components (year, month, day, hour, minute, second...) will also return the correct values for the local time zone by default, so, generally, doing the natural things will lead to natural and correct results.

If you only want to do this, you may safely skip the rest of this section. However, if you want to work with different time zones, you should read it to the end.

In this (rare) case, you are still limited to the local time zone when constructing wxDateTime objects, i.e. there is no way to construct a wxDateTime corresponding to the given date in, say, Pacific Standard Time. To do it, you will need to call *ToTimezone* (p. 242) or *MakeTimezone* (p. 243) methods to adjust the date for the target time zone. There are also special versions of these functions *ToGMT* (p. 243) and *MakeGMT* (p. 243) for the most common case - when the date should be constructed in GMT.

You also can just retrieve the value for some time zone without converting the obejct to it first. For this you may pass TimeZone argument to any of the methods which are affected by the time zone (all methods getting date components and the date formatting ones, for example). In particular, the Format() family of methods accepts a TimeZone

parameter and this allows to simply print time in any time zone.

To see how to do it, the last issue to address is how to construct a TimeZone object which must be passed to all these methods. First of all, you may construct it manually by specifying the time zone offset in seconds from GMT, but usually you will just use one of the *symbolic time zone names* (p. 215) and let the conversion constructor do the job. I.e. you would just write

```
wxDateTime dt(...whatever...);
printf("The time is %s in local time zone", dt.FormatTime().c_str());
printf("The time is %s in GMT",
dt.FormatTime(wxDateTime::GMT).c_str());
```

Daylight saving time (DST)

DST (a.k.a. 'summer time') handling is always a delicate task which is better left to the operating system which is supposed to be configured by the administrator to behave correctly. Unfortunately, when doing calculations with date outside of the range supported by the standard library, we are forced to deal with these issues ourselves.

Several functions are provided to calculate the beginning and end of DST in the given year and to determine whether it is in effect at the given moment or not, but they should not be considered as absolutely correct because, first of all, they only work more or less correctly for only a handful of countries (any information about other ones appreciated!) and even for them the rules may perfectly well change in the future.

The time zone handling *methods* (p. 1346) use these functions too, so they are subject to the same limitations.

wxDateTime and Holidays

TODO.

Compatibility

The old classes for date/time manipulations ported from wxWindows version 1.xx are still included but are reimplemented in terms of wxDateTime. However, using them is strongly discouraged because they have a few quirks/bugs and were not 'Y2K' compatible.

Unicode support in wxWindows

This section briefly describes the state of the Unicode support in wxWindows. Read it if you want to know more about how to write programs able to work with characters from

languages other than English.

What is Unicode?

Starting with release 2.1 wxWindows has support for compiling in Unicode mode on the platforms which support it. Unicode is a standard for character encoding which addresses the shortcomings of the previous, 8 bit standards, by using 16 bit for encoding each character. This allows to have 65536 characters instead of the usual 256 and is sufficient to encode all of the world languages at once. More details about Unicode may be found at `www.unicode.org`.

As this solution is obviously preferable to the previous ones (think of incompatible encodings for the same language, locale chaos and so on), many modern operating systems support it. The probably first example is Windows NT which uses only Unicode internally since its very first version.

Writing internationalized programs is much easier with Unicode and, as the support for it improves, it should become more and more so. Moreover, in the Windows NT/2000 case, even the program which uses only standard ASCII can profit from using Unicode because they will work more efficiently - there will be no need for the system to convert all strings the program uses to/from Unicode each time a system call is made.

Unicode and ANSI modes

As not all platforms supported by wxWindows support Unicode (fully) yet, in many cases it is unwise to write a program which can only work in Unicode environment. A better solution is to write programs in such way that they may be compiled either in ANSI (traditional) mode or in the Unicode one.

This can be achieved quite simply by using the means provided by wxWindows. Basically, there are only a few things to watch out for:

- Character type (`char` or `wchar_t`)
- Literal strings (i.e. `"Hello, world!"` or `'*'`)
- String functions (`strlen()`, `strcpy()`, ...)

Let's look at them in order. First of all, each character in an Unicode program takes 2 bytes instead of usual one, so another type should be used to store the characters (`char` only holds 1 byte usually). This type is called `wchar_t` which stands for *wide-character type*.

Also, the string and character constants should be encoded on 2 bytes instead of one. This is achieved by using the standard C (and C++) way: just put the letter `'L'` after any string constant and it becomes a *long*constant, i.e. a wide character one. To make things a bit more readable, you are also allowed to prefix the constant with `'L'` instead of putting it after it.

Finally, the standard C functions don't work with `wchar_t` strings, so another set of

functions exists which do the same thing but accept `wchar_t *` instead of `char *`. For example, a function to get the length of a wide-character string is called `wcslen()` (compare with `strlen()` - you see that the only difference is that the "str" prefix standing for "string" has been replaced with "wcs" standing for "wide-character string").

To summarize, here is a brief example of how a program which can be compiled in both ANSI and Unicode modes could look like:

```
#ifdef __UNICODE__
    wchar_t wch = L'*';
    const wchar_t *ws = L"Hello, world!";
    int len = wcslen(ws);
#else // ANSI
    char ch = '*';
    const char *s = "Hello, world!";
    int len = strlen(s);
#endif // Unicode/ANSI
```

Of course, it would be nearly impossibly to write such programs if it had to be done this way (try to imagine the number of `#ifdef UNICODE` an average program would have had!). Luckily, there is another way - see the next section.

Unicode support in wxWindows

In wxWindows, the code fragment from above should be written instead:

```
wxChar ch = wxT('*');
wxString s = wxT("Hello, world!");
int len = s.Len();
```

What happens here? First of all, you see that there are no more `#ifdef`s at all. Instead, we define some types and macros which behave differently in the Unicode and ANSI builds and allows us to avoid using conditional compilation in the program itself.

We have a `wxChar` type which maps either on `char` or `wchar_t` depending on the mode in which program is being compiled. There is no need for a separate type for strings though, because the standard *wxString* (p. 1011) supports Unicode, i.e. it stores either ANSI or Unicode strings depending on the compile mode.

Finally, there is a special `wxT()` macro which should enclose all literal strings in the program. As it is easy to see comparing the last fragment with the one above, this macro expands to nothing in the (usual) ANSI mode and prefixes `'L'` to its argument in the Unicode mode.

The important conclusion is that if you use `wxChar` instead of `char`, avoid using C style strings and use `wxString` instead and don't forget to enclose all string literals inside `wxT()` macro, your program automatically becomes (almost) Unicode compliant!

Just let us state once again the rules:

- Always use `wxChar` instead of `char`

- Always enclose literal string constants in `wxT()` macro unless they're already converted to the right representation (another standard wxWindows macro `_()` does it, so there is no need for `wxT()` in this case) or you intend to pass the constant directly to an external function which doesn't accept wide-character strings.

- Use `wxString` instead of C style strings.

Unicode and the outside world

We have seen that it was easy to write Unicode programs using wxWindows types and macros, but it has been also mentioned that it isn't quite enough. Although everything works fine inside the program, things can get nasty when it tries to communicate with the outside world which, sadly, often expects ANSI strings (a notable exception is the entire Win32 API which accepts either Unicode or ANSI strings and which thus makes it unnecessary to ever perform any conversions in the program).

To get a ANSI string from a wxString, you may use the mb_str() function which always returns an ANSI string (independently of the mode - while the usual *c_str()* (p. 1021) returns a pointer to the internal representation which is either ASCII or Unicode). More rarely used, but still useful, is wc_str() function which always returns the Unicode string.

Unicode-related compilation settings

You should define `wxUSE_UNICODE` to 1 to compile your program in Unicode mode. Note that it currently only works in Win32 and that some parts of wxWindows are not Unicode-compliant yet (ODBC classes, for example). If you compile your program in ANSI mode you can still define `wxUSE_WCHAR_T` to get some limited support for `wchar_t` type.

This will allow your program to perform conversions between Unicode strings and ANSI ones (*wxEncodingConverter* (p. 373) depends on this partially) and construct wxString objects from Unicode strings (presumably read from some external file or elsewhere).

wxMBConv classes overview

Classes: *wxMBConv* (p. 665), *wxMBConvFile* (p. 668), *wxMBConvUTF7* (p. 668), *wxMBConvUTF8* (p. 669), *wxCSConv* (p. 181)

The wxMBConv classes in wxWindows enables an Unicode-aware application to easily convert between Unicode and the variety of 8-bit encoding systems still in use.

Background: The need for conversion

As programs are becoming more and more globalized, and users exchange documents across country boundaries as never before, applications increasingly need to take into account all the different character sets in use around the world. It is no longer enough to just depend on the default byte-sized character set that computers have traditionally used.

A few years ago, a solution was proposed: the Unicode standard. Able to contain the complete set of characters in use in one unified global coding system, it would resolve the character set problems once and for all.

But it hasn't happened yet, and the migration towards Unicode has created new challenges, resulting in "compatibility encodings" such as UTF-8. A large number of systems out there still depends on the old 8-bit encodings, hampered by the huge amounts of legacy code still widely deployed. Even sending Unicode data from one Unicode-aware system to another may need encoding to an 8-bit multibyte encoding (UTF-7 or UTF-8 is typically used for this purpose), to pass unhindered through any traditional transport channels.

Background: The wxString class

If you have compiled wxWindows in Unicode mode, the wxChar type will become identical to wchar_t rather than char, and a wxString stores wxChars. Hence, all wxString manipulation in your application will then operate on Unicode strings, and almost as easily as working with ordinary char strings (you just need to remember to use the wxT() macro to encapsulate any string literals).

But often, your environment doesn't want Unicode strings. You could be sending data over a network, or processing a text file for some other application. You need a way to quickly convert your easily-handled Unicode data to and from a traditional 8-bit-encoding. And this is what the wxMBConv classes do.

wxMBConv classes

The base class for all these conversions is the wxMBConv class (which itself implements standard libc locale conversion). Derived classes include wxMBConvFile, wxMBConvUTF7, wxMBConvUTF8, and wxCSConv, which implement different kinds of conversions. You can also derive your own class for your own custom encoding and use it, should you need it. All you need to do is override the MB2WC and WC2MB methods.

wxMBConv objects

In C++, for a class to be useful and possible to pass around, it needs to be instantiated. All of the wxWindows-provided wxMBConv classes have predefined instances (wxConvLibc, wxConvFile, wxConvUTF7, wxConvUTF8, wxConvLocal). You can use

these predefined objects directly, or you can instantiate your own objects.

A variable, wxConvCurrent, points to the conversion object that the user interface is supposed to use, in the case that the user interface is not Unicode-based (like with GTK+ 1.2). By default, it points to wxConvLibc or wxConvLocal, depending on which works best on the current platform.

wxCSConv

The wxCSConv class is special because when it is instantiated, you can tell it which character set it should use, which makes it meaningful to keep many instances of them around, each with a different character set (or you can create a wxCSConv instance on the fly).

The predefined wxCSConv instance, wxConvLocal, is preset to use the default user character set, but you should rarely need to use it directly, it is better to go through wxConvCurrent.

Converting strings

Once you have chosen which object you want to use to convert your text, here is how you would use them with wxString. These examples all assume that you are using a Unicode build of wxWindows, although they will still compile in a non-Unicode build (they just won't convert anything).

Example 1: Constructing a wxString from input in current encoding.

```
wxString str(input_data, *wxConvCurrent);
```

Example 2: Input in UTF-8 encoding.

```
wxString str(input_data, wxConvUTF8);
```

Example 3: Input in KOI8-R. Construction of wxCSConv instance on the fly.

```
wxString str(input_data, wxCSConv(wxT("koi8-r")));
```

Example 4: Printing a wxString to stdout in UTF-8 encoding.

```
puts(str.mb_str(wxConvUTF8));
```

Example 5: Printing a wxString to stdout in custom encoding. Using preconstructed wxCSConv instance.

```
wxCSConv cust(user_encoding);
printf("Data: %s\n", (const char*) str.mb_str(cust));
```

Note: Since mb_str() returns a temporary wxCharBuffer to hold the result of the conversion, you need to explicitly cast it to const char* if you use it in a vararg context

(like with printf).

Converting buffers

If you have specialized needs, or just don't want to use wxString, you can also use the conversion methods of the conversion objects directly. This can even be useful if you need to do conversion in a non-Unicode build of wxWindows; converting a string from UTF-8 to the current encoding should be possible by doing this:

```
wxString str(wxConvUTF8.cMB2WC(input_data), *wxConvCurrent);
```

Here, cMB2WC of the UTF8 object returns a wxWCharBuffer containing a Unicode string. The wxString constructor then converts it back to an 8-bit character set using the passed conversion object, *wxConvCurrent. (In a Unicode build of wxWindows, the constructor ignores the passed conversion object and retains the Unicode data.)

This could also be done by first making a wxString of the original data:

```
wxString input_str(input_data);
wxString str(input_str.wc_str(wxConvUTF8), *wxConvCurrent);
```

To print a wxChar buffer to a non-Unicode stdout:

```
printf("Data: %s\n", (const char*) wxConvCurrent-
>cWX2MB(unicode_data));
```

If you need to do more complex processing on the converted data, you may want to store the temporary buffer in a local variable:

```
const wxWX2MBbuf tmp_buf = wxConvCurrent->cWX2MB(unicode_data);
const char *tmp_str = (const char*) tmp_buf;
printf("Data: %s\n", tmp_str);
process_data(tmp_str);
```

If a conversion had taken place in cWX2MB (i.e. in a Unicode build), the buffer will be deallocated as soon as tmp_buf goes out of scope. (The macro wxWX2MBbuf reflects the correct return value of cWX2MB (either char* or wxCharBuffer), except for the const.)

Internationalization

Although internationalization of an application (i18n for short) involves far more than just translating its text messages to another message -- date, time and currency formats need changing too, some languages are written left to right and others right to left, character encoding may differ and many other things may need changing too -- it is a necessary first step. wxWindows provides facilities for message translation with its *wxLocale* (p. 652) class and is itself fully translated into several languages. Please

consult wxWindows home page for the most up-to-date translations - and if you translate it into one of the languages not done yet, your translations would be gratefully accepted for inclusion into the future versions of the library!

The wxWindows approach to i18n closely follows GNU gettext package. wxWindows uses the message catalogs which are binary compatible with gettext catalogs and this allows to use all of the programs in this package to work with them. But note that no additional libraries are needed during the run-time, however, so you have only the message catalogs to distribute and nothing else.

During program development you will need the gettext package for working with message catalogs. **Warning:** gettext versions < 0.10 are known to be buggy, so you should find a later version of it!

There are two kinds of message catalogs: source catalogs which are text files with extension .po and binary catalogs which are created from the source ones with *msgfmt* program (part of gettext package) and have the extension .mo. Only the binary files are needed during program execution.

The program i18n involves several steps:

1. Translating the strings in the program text using *wxGetTranslation* (p. 1261) or equivalently the _() macro.
2. Extracting the strings to be translated from the program: this uses the work done in the previous step because *xgettext* program used for string extraction may be told (using its -k option) to recognise _() and wxGetTranslation and extract all strings inside the calls to these functions. Alternatively, you may use -a option to extract all the strings, but it will usually result in many strings being found which don't have to be translated at all. This will create a text message catalog - a .po file.
3. Translating the strings extracted in the previous step to other language(s). It involves editing the .po file.
4. Compiling the .po file into .mo file to be used by the program.
5. Setting the appropriate locale in your program to use the strings for the given language: see *wxLocale* (p. 652).

See also the GNU gettext documentation linked from `docs/html/index.htm` in your wxWindows distribution.

See also *Writing non-English applications* (p. 1354). It focuses on handling charsets related problems.

Writing non-English applications

This article describes how to write applications that communicate with user in language other than English. Unfortunately many languages use different charsets under Unix and Windows (and other platforms, to make situation even more complicated). These

charsets usually differ in so many characters it is impossible to use same texts under all platforms.

wxWindows library provides mechanism that helps you avoid distributing many identical, only differently encoded, packages with your application (e.g. help files and menu items in iso8859-13 and windows-1257). Thanks to this mechanism you can, for example, distribute only iso8859-13 data and it will be handled transparently under all systems.

Please read *Internationalization* (p. 1353) which describes the locales concept.

In the following text, wherever *iso8859-2* and *windows-1250* are used, any encodings are meant and any encodings may be substituted there.

Locales

The best way to ensure correctly displayed texts in a GUI across platforms is to use locales. Write your in-code messages in English or without diacritics and put real messages into the message catalog (see *Internationalization* (p. 1353)).

A standard .po file begins with a header like this:

```
# SOME DESCRIPTIVE TITLE.
# Copyright (C) YEAR Free Software Foundation, Inc.
# FIRST AUTHOR <EMAIL@ADDRESS>, YEAR.
#
msgid ""
msgstr ""
"Project-Id-Version: PACKAGE VERSION\n"
"POT-Creation-Date: 1999-02-19 16:03+0100\n"
"PO-Revision-Date: YEAR-MO-DA HO:MI+ZONE\n"
"Last-Translator: FULL NAME <EMAIL@ADDRESS>\n"
"Language-Team: LANGUAGE <LL@li.org>\n"
"MIME-Version: 1.0\n"
"Content-Type: text/plain; charset=CHARSET\n"
"Content-Transfer-Encoding: ENCODING\n"
```

Notice this particular line:

```
"Content-Type: text/plain; charset=CHARSET\n"
```

It specifies the charset used by the catalog. All strings in the catalog are encoded using this charset.

You have to fill in proper charset information. Your .po file may look like this after doing so:

```
# SOME DESCRIPTIVE TITLE.
# Copyright (C) YEAR Free Software Foundation, Inc.
# FIRST AUTHOR <EMAIL@ADDRESS>, YEAR.
#
msgid ""
msgstr ""
"Project-Id-Version: PACKAGE VERSION\n"
```

```
"POT-Creation-Date: 1999-02-19 16:03+0100\n"
"PO-Revision-Date: YEAR-MO-DA HO:MI+ZONE\n"
"Last-Translator: FULL NAME <EMAIL@ADDRESS>\n"
"Language-Team: LANGUAGE <LL@li.org>\n"
"MIME-Version: 1.0\n"
"Content-Type: text/plain; charset=iso8859-2\n"
"Content-Transfer-Encoding: 8bit\n"
```

(Make sure that the header is **not** marked as *fuzzy*.)

wxWindows is able to use this catalog under any supported platform (although iso8859-2 is a Unix encoding and is normally not understood by Windows).

How is this done? When you tell the wxLocale class to load a message catalog that contains correct header, it checks the charset. If the charset is "alien" on the platform the program is currently running (e.g. any of ISO encodings under Windows or CP12XX under Unix) it uses *wxEncodingConverter::GetPlatformEquivalents* (p. 375)to obtain an encoding that is more common on this platform and converts the message catalog to this encoding. Note that it does **not** check for presence of fonts in the "platform" encoding! It only assumes that it is always better to have strings in platform native encoding than in an encoding that is rarely (if ever) used.

The behaviour described above is disabled by default. You must set *bConvertEncoding* to TRUE in *wxLocale constructor* (p. 652) in order to enable runtime encoding conversion.

Font mapping

You can use *wxEncodingConverter* (p. 373) and *wxFontMapper* (p. 451) to display text:

```
if (!wxTheFontMapper->IsEncodingAvailable(enc, facename))
{
   wxFontEncoding alternative;
   if (wxTheFontMapper->GetAltForEncoding(enc, &alternative,
                                          facename, FALSE))
   {
       wxEncodingConverted encconv;
       if (!encconv.Init(enc, alternative))
           ...failure...
       else
           text = encconv.Convert(text);
   }
   else
       ...failure...
}
...display text...
```

Converting data

You may want to store all program data (created documents etc.) in the same encoding, let's say windows1250. Obviously, the best way would be to use *wxEncodingConverter* (p. 373).

Help files

If you're using *wxHtmlHelpController* (p. 522) there is no problem at all. You must only make sure that all the HTML files contain the META tag, e.g.

```
<meta http-equiv="Content-Type" content="text/html; charset=iso8859-2">
```

and that the hhp project file contains one additional line in the OPTIONSsection:

```
Charset=iso8859-2
```

This additional entry tells the HTML help controller what encoding is used in contents and index tables.

Container classes overview

Classes: *wxList* (p. 619), *wxArray* (p. 32)

wxWindows uses itself several container classes including doubly-linked lists and dynamic arrays (i.e. arrays which expand automatically when they become full). For both historical and portability reasons wxWindows does not use STL which provides the standard implementation of many container classes in C++. First of all, wxWindows has existed since well before STL was written, and secondly we don't believe that today compilers can deal really well with all of STL classes (this is especially true for some less common platforms). Of course, the compilers are evolving quite rapidly and hopefully their progress will allow to base future versions of wxWindows on STL - but this is not yet the case.

wxWindows container classes don't pretend to be as powerful or full as STL ones, but they are quite useful and may be compiled with absolutely any C++ compiler. They're used internally by wxWindows, but may, of course, be used in your programs as well if you wish.

The list classes in wxWindows are doubly-linked lists which may either own the objects they contain (meaning that the list deletes the object when it is removed from the list or the list itself is destroyed) or just store the pointers depending on whether you called or not *wxList::DeleteContents* (p. 622) method.

Dynamic arrays resemble C arrays but with two important differences: they provide run-time range checking in debug builds and they expand automatically the allocated memory when there is no more space for new items. They come in two sorts: the "plain" arrays which store either built-in types such as "char", "int" or "bool" or the pointers to arbitrary objects, or "object arrays" which own the object pointers to which they store.

For the same portability reasons, the container classes implementation in wxWindows does not use templates, but is rather based on C preprocessor i.e. is done with the macros: *WX_DECLARE_LIST* and *WX_DEFINE_LIST* for the linked lists and

WX_DECLARE_ARRAY, *WX_DECLARE_OBJARRAY* and *WX_DEFINE_OBJARRAY* for the dynamic arrays. The "DECLARE" macro declares a new container class containing the elements of given type and is needed for all three types of container classes: lists, arrays and objarrays. The "DEFINE" classes must be inserted in your program in a place where the **full declaration of container element class is in scope** (i.e. not just forward declaration), otherwise destructors of the container elements will not be called! As array classes never delete the items they contain anyhow, there is no WX_DEFINE_ARRAY macro for them.

Examples of usage of these macros may be found in *wxList* (p. 619) and *wxArray* (p. 32) documentation.

Finally, wxWindows predefines several commonly used container classes. wxList is defined for compatibility with previous versions as a list containing wxObjects and wxStringList as a list of C-style strings (char *), both of these classes are deprecated and should not be used in new programs. The following array classes are defined: wxArrayInt, wxArrayLong, wxArrayPtrVoid and wxArrayString. The first three store elements of corresponding types, but wxArrayString is somewhat special: it is an optimized version of wxArray which uses its knowledge about *wxString* (p. 1011) reference counting schema.

File classes and functions overview

Classes: *wxFile* (p. 398), *wxDir* (p. 325), *wxTempFile* (p. 1073), *wxTextFile* (p. 1100)

Functions: see *file functions* (p. 1253).

wxWindows provides some functions and classes to facilitate working with files. As usual, the accent is put on cross-platform features which explains, for example, the *wxTextFile* (p. 1100) class which may be used to convert between different types of text files (DOS/Unix/Mac).

wxFile may be used for low-level IO. It contains all the usual functions to work with files (opening/closing, reading/writing, seeking, and so on) but compared with using standard C functions, has error checking (in case of an error a message is logged using *wxLog* (p. 655) facilities) and closes the file automatically in the destructor which may be quite convenient.

wxTempFile is a very small file designed to make replacing the files contents safer - see its *documentation* (p. 1073) for more details.

wxTextFile is a general purpose class for working with small text files on line by line basis. It is especially well suited for working with configuration files and program source files. It can be also used to work with files with "non native" line termination characters and write them as "native" files if needed (in fact, the files may be written in any format).

wxDir is a helper class for enumerating the files or subdirectories of a directory. It may

be used to enumerate all files, only files satisfying the given template mask or only non-hidden files.

wxStreams overview

Classes: *wxStreamBase* (p. 1003), *wxStreamBuffer* (p. 1005), *wxInputStream* (p. 595), *wxOutputStream* (p. 755), *wxFilterInputStream* (p. 435), *wxFilterOutputStream* (p. 435)

Purpose of wxStream

We had troubles with standard C++ streams on several platforms: they react quite well in most cases, but in the multi-threaded case, for example, they have many problems. Some Borland Compilers refuse to work at all with them and using iostreams on Linux makes writing programs, that are binary compatible across different Linux distributions, impossible.

Therefore, wxStreams have been added to wxWindows because an application should compile and run on all supported platforms and we don't want users to depend on release X.XX of libg++ or some other compiler to run the program.

wxStreams is divided in two main parts:

1. the core: wxStreamBase, wxStreamBuffer, wxInputStream, wxOutputStream, wxFilterIn/OutputStream
2. the "IO" classes: wxSocketIn/OutputStream, wxDataIn/OutputStream, wxFileIn/OutputStream, ...

wxStreamBase is the base definition of a stream. It defines, for example, the API of OnSysRead, OnSysWrite, OnSysSeek and OnSysTell. These functions are really implemented by the "IO" classes. wxInputStream and wxOutputStream inherit from it.

wxStreamBuffer is a cache manager for wxStreamBase (it manages a stream buffer linked to a stream). One stream can have multiple stream buffers but one stream have always one autoinitialized stream buffer.

wxInputStream is the base class for read-only streams. It implements Read, SeekI (I for Input), and all read or IO generic related functions. wxOutputStream does the same thing but it is for write-only streams.

wxFilterIn/OutputStream is the base class definition for stream filtering. Stream filtering means a stream which does no syscall but filters data which are passed to it and then pass them to another stream. For example, wxZLibInputStream is an inline stream decompressor.

The "IO" classes implements the specific parts of the stream. This could be nothing in the case of wxMemoryIn/OutputStream which bases itself on wxStreamBuffer. This could also be a simple link to the a true syscall (for example read(...), write(...)).

Generic usage: an example

Usage is simple. We can take the example of wxFileInputStream and here is some sample code:

```
 ...
 // The constructor initializes the stream buffer and open the file
descriptor
 // associated to the name of the file.
 wxFileInputStream in_stream("the_file_to_be_read");

 // Ok, read some bytes ... nb_datas is expressed in bytes.
 in_stream.Read(data, nb_datas);
 if (in_stream.LastError() != wxSTREAM_NOERROR) {
   // Oh oh, something bad happens.
   // For a complete list, look into the documentation at wxStreamBase.
 }

 // You can also inline all like this.
 if (in_stream.Read(data, nb_datas).LastError() != wxSTREAM_NOERROR) {
   // Do something.
 }

 // You can also get the last number of bytes REALLY put into the
buffer.
 size_t really_read = in_stream.LastRead();

 // Ok, moves to the beginning of the stream. SeekI returns the last
position
 // in the stream counted from the beginning.
 off_t old_position = in_stream.SeekI(0, wxFromBeginning);

 // What is my current position ?
 off_t position = in_stream.TellI();

 // wxFileInputStream will close the file descriptor on the
destruction.
```

Compatibility with C++ streams

As I said previously, we could add a filter stream so it takes an istream argument and builds a wxInputStream from it: I don't think it should be difficult to implement it and it may be available in the fix of wxWindows 2.0.

wxLog classes overview

Classes: *wxLog* (p. 655), wxLogStderr, wxLogOstream, wxLogTextCtrl, wxLogWindow, wxLogGui, wxLogNull

This is a general overview of logging classes provided by wxWindows. The word logging

here has a broad sense, including all of the program output, not only non interactive messages. The logging facilities included in wxWindows provide the base *wxLog* class which defines the standard interface for a *log target* as well as several standard implementations of it and a family of functions to use with them.

First of all, no knowledge of *wxLog* classes is needed to use them. For this, you should only know about *wxLogXXX()* functions. All of them have the same syntax as *printf()*, i.e. they take the format string as the first argument and a variable number of arguments. Here are all of them:

- **wxLogFatalError** which is like *wxLogError*, but also terminates the program with the exit code 3 (using *abort()* standard function also terminates the program with this exit code).
- **wxLogError** is the function to use for error messages, i.e. the messages that must be shown to the user. The default processing is to pop up a message box to inform the user about it.
- **wxLogWarning** for warnings - they are also normally shown to the user, but don't interrupt the program work.
- **wxLogMessage** is for all normal, informational messages. They also appear in a message box by default (but it can be changed, see below). Notice that the standard behaviour is to not show informational messages if there are any errors later - the logic being that the later error messages make the informational messages preceding them meaningless.
- **wxLogVerbose** is for verbose output. Normally, it is suppressed, but might be activated if the user wishes to know more details about the program progress (another, but possibly confusing name for the same function is **wxLogInfo**).
- **wxLogStatus** is for status messages - they will go into the status bar of the active or specified (as the first argument) *wxFrame* (p. 454) if it has one.
- **wxLogSysError** is mostly used by wxWindows itself, but might be handy for logging errors after system call (API function) failure. It logs the specified message text as well as the last system error code (*errno* or *::GetLastError()* depending on the platform) and the corresponding error message. The second form of this function takes the error code explicitly as the first argument.
- **wxLogDebug** is **the** right function for debug output. It only does anything at all in the debug mode (when the preprocessor symbol__WXDEBUG__ is defined) and expands to nothing in release mode (otherwise).**Tip:** under Windows, you must either run the program under debugger or use a 3rd party program such as DbgView (`http://www.sysinternals.com`) to actually see the debug output.
- **wxLogTrace** as **wxLogDebug** only does something in debug build. The reason for making it a separate function from it is that usually there are a lot of trace messages, so it might make sense to separate them from other debug messages which would be flooded in them. Moreover, the second version of this function takes a trace mask as the first argument which allows to further restrict the amount of messages generated.

The usage of these functions should be fairly straightforward, however it may be asked why not use the other logging facilities, such as C standard stdio functions or C++ streams. The short answer is that they're all very good generic mechanisms, but are not really adapted for wxWindows, while the log classes are. Some of advantages in using

wxWindows log functions are:

- **Portability** It is a common practice to use *printf()* statements or cout/cerr C++ streams for writing out some (debug or otherwise) information. Although it works just fine under Unix, these messages go strictly nowhere under Windows where the stdout of GUI programs is not assigned to anything. Thus, you might view *wxLogMessage()* as a simple substitute for *printf().*

  Moreover *wxMSW* doesn't have a **console** as you may have with *wxGTK*. Under *wxMSW*, a call using *cout* just goes nowhere. To cope with this problem, *wxWindows* provides a way to redirect *cout* calls to *wxTextCtrl* (p. 1075), *i.e.*:
  ```
  wxLogWindow *logger=new wxLogWindow(your_frame,"Logger");
  cout=*new ostream(logger->GetTextCtrl());
  wxLog::SetActiveTarget(logger);
  ```

  On the opposite, if you like your *wxLogXXX* calls to behave as a *cout* call does, just write :
  ```
  wxLog *logger=new wxLogStream(&cout);
  wxLog::SetActiveTarget(logger);
  ```

- **Flexibility** The output of wxLog functions can be redirected or suppressed entirely based on their importance, which is either impossible or difficult to do with traditional methods. For example, only error messages, or only error messages and warnings might be logged, filtering out all informational messages.

- **Completeness** Usually, an error message should be presented to the user when some operation fails. Let's take a quite simple but common case of a file error: suppose that you're writing your data file on disk and there is not enough space. The actual error might have been detected inside wxWindows code (say, in *wxFile::Write*), so the calling function doesn't really know the exact reason of the failure, it only knows that the data file couldn't be written to the disk. However, as wxWindows uses *wxLogError()* in this situation, the exact error code (and the corresponding error message) will be given to the user together with "high level" message about data file writing error.

After having enumerated all the functions which are normally used to log the messages, and why would you want to use them we now describe how all this works.

wxWindows has the notion of a *log target*: it is just a class deriving from *wxLog* (p. 655). As such, it implements the virtual functions of the base class which are called when a message is logged. Only one log target is *active* at any moment, this is the one used by *wxLogXXX()* functions. The normal usage of a log object (i.e. object of a class derived from wxLog) is to install it as the active target with a call to *SetActiveTarget()* and it will be used automatically by all subsequent calls to *wxLogXXX()* functions.

To create a new log target class you only need to derive it from wxLog and implement one (or both) of *DoLog()* and *DoLogString()* in it. The second one is enough if you're happy with the standard wxLog message formatting (prepending "Error:" or "Warning:", timestamping &c) but just want to send the messages somewhere else. The first one may be overridden to do whatever you want but you have to distinguish between the

different message types yourself.

There are some predefined classes deriving from wxLog and which might be helpful to see how you can create a new log target class and, of course, may also be used without any change. There are:

- **wxLogStderr** This class logs messages to a *FILE **, using stderr by default as its name suggests.
- **wxLogStream** This class has the same functionality as wxLogStderr, but uses *ostream* and cerr instead of *FILE ** and stderr.
- **wxLogGui** This is the standard log target for wxWindows applications (it is used by default if you don't do anything) and provides the most reasonable handling of all types of messages for given platform.
- **wxLogWindow** This log target provides a "log console" which collects all messages generated by the application and also passes them to the previous active log target. The log window frame has a menu allowing user to clear the log, close it completely or save all messages to file.
- **wxLogNull** The last log class is quite particular: it doesn't do anything. The objects of this class may be instantiated to (temporarily) suppress output of *wxLogXXX()* functions. As an example, trying to open a non-existing file will usually provoke an error message, but if for some reasons it is unwanted, just use this construction:

```
  wxFile file;

  // wxFile.Open() normally complains if file can't be opened, we
don't want it
  {
    wxLogNull logNo;
    if ( !file.Open("bar") )
      ... process error ourselves ...
  } // ~wxLogNull called, old log sink restored

  wxLogMessage("..."); // ok
```

Debugging overview

Classes, functions and macros: *wxDebugContext* (p. 306), *wxObject* (p. 750), *wxLog* (p. 655), *Log functions* (p. 1304), *Debug macros* (p. 1308)

Various classes, functions and macros are provided in wxWindows to help you debug your application. Most of these are only available if you compile both wxWindows, your application and *all* libraries that use wxWindows with the __WXDEBUG__ symbol defined. You can also test the __WXDEBUG__ symbol in your own applications to execute code that should be active only in debug mode.

wxDebugContext

wxDebugContext (p. 306) is a class that never gets instantiated, but ties together various static functions and variables. It allows you to dump all objects to that stream, write statistics about object allocation, and check memory for errors.

It is good practice to define a *wxObject::Dump* (p. 751) member function for each class you derive from a wxWindows class, so that *wxDebugContext::Dump* (p. 307) can call it and give valuable information about the state of the application.

If you have difficulty tracking down a memory leak, recompile in debugging mode and call *wxDebugContext::Dump* (p. 307) and *wxDebugContext::PrintStatistics* (p. 309) at appropriate places. They will tell you what objects have not yet been deleted, and what kinds of object they are. In fact, in debug mode wxWindows will automatically detect memory leaks when your application is about to exit, and if there are any leaks, will give you information about the problem. (How much information depends on the operating system and compiler -- some systems don't allow all memory logging to be enabled). See the memcheck sample for example of usage.

For wxDebugContext to do its work, the *new* and *delete* operators for wxObject have been redefined to store extra information about dynamically allocated objects (but not statically declared objects). This slows down a debugging version of an application, but can find difficult-to-detect memory leaks (objects are not deallocated), overwrites (writing past the end of your object) and underwrites (writing to memory in front of the object).

If debugging mode is on and the symbol wxUSE_GLOBAL_MEMORY_OPERATORS is set to 1 in setup.h, 'new' is defined to be:

```
#define new new(__FILE__,__LINE__)
```

All occurrences of 'new' in wxWindows and your own application will use the overridden form of the operator with two extra arguments. This means that the debugging output (and error messages reporting memory problems) will tell you what file and on what line you allocated the object. Unfortunately not all compilers allow this definition to work properly, but most do.

Debug macros

You should also use *debug macros* (p. 1308) as part of a 'defensive programming' strategy, scattering wxASSERTs liberally to test for problems in your code as early as possible. Forward thinking will save a surprising amount of time in the long run.

wxASSERT (p. 1309) is used to pop up an error message box when a condition is not true. You can also use *wxASSERT_MSG* (p. 1309) to supply your own helpful error message. For example:

```
void MyClass::MyFunction(wxObject* object)
{
    wxASSERT_MSG( (object != NULL), "object should not be NULL in
```

```
MyFunction!" );

    ...
  };
```

The message box allows you to continue execution or abort the program. If you are running the application inside a debugger, you will be able to see exactly where the problem was.

Logging functions

You can use the *wxLogDebug* (p. 1305) and *wxLogTrace* (p. 1305) functions to output debugging information in debug mode; it will do nothing for non-debugging code.

wxDebugContext overview

Debugging overview (p. 1363)

Class: *wxDebugContext* (p. 306)

wxDebugContext is a class for performing various debugging and memory tracing operations.

This class has only static data and function members, and there should be no instances. Probably the most useful members are SetFile (for directing output to a file, instead of the default standard error or debugger output); Dump (for dumping the dynamically allocated objects) and PrintStatistics (for dumping information about allocation of objects). You can also call Check to check memory blocks for integrity.

Here's an example of use. The SetCheckpoint ensures that only the allocations done after the checkpoint will be dumped.

```
wxDebugContext::SetCheckpoint();

wxDebugContext::SetFile("c:\\temp\\debug.log");

wxString *thing = new wxString;

char *ordinaryNonObject = new char[1000];

wxDebugContext::Dump();
wxDebugContext::PrintStatistics();
```

You can use wxDebugContext if __WXDEBUG__ is defined, or you can use it at any other time (if wxUSE_DEBUG_CONTEXT is set to 1 in setup.h). It is not disabled in non-debug mode because you may not wish to recompile wxWindows and your entire application just to make use of the error logging facility.

Note: wxDebugContext::SetFile has a problem at present, so use the default stream

instead. Eventually the logging will be done through the wxLog facilities instead.

wxConfig classes overview

Classes: *wxConfig* (p. 162)

This overview briefly describes what the config classes are and what they are for. All the details about how to use them may be found in the description of the *wxConfigBase* (p. 162) class and the documentation of the file, registry and INI file based implementations mentions all the features/limitations specific to each one of these versions.

The config classes provide a way to store some application configuration information. They were especially designed for this usage and, although may probably be used for many other things as well, should be limited to it. It means that this information should be:

1. Typed, i.e. strings or numbers for the moment. You can not store binary data, for example.
2. Small. For instance, it is not recommended to use the Windows registry for amounts of data more than a couple of kilobytes.
3. Not performance critical, neither from speed nor from a memory consumption point of view.

On the other hand, the features provided make them very useful for storing all kinds of small to medium volumes of hierarchically-organized, heterogeneous data. In short, this is a place where you can conveniently stuff all your data (numbers and strings) organizing it in a tree where you use the filesystem-like paths to specify the location of a piece of data. In particular, these classes were designed to be as easy to use as possible.

From another point of view, they provide an interface which hides the differences between the Windows registry and the standard Unix text format configuration files. Other (future) implementations of wxConfigBase might also understand GTK resource files or their analogues on the KDE side.

In any case, each implementation of wxConfigBase does its best to make the data look the same way everywhere. Due to the limitations of the underlying physical storage as in the case of wxIniConfig, it may not implement 100% of the base class functionality.

There are groups of entries and the entries themselves. Each entry contains either a string or a number (or a boolean value; support for other types of data such as dates or timestamps is planned) and is identified by the full path to it: something like /MyApp/UserPreferences/Colors/Foreground. The previous elements in the path are the group names, and each name may contain an arbitrary number of entries and subgroups. The path components are **always** separated with a slash, even though some implementations use the backslash internally. Further details (including how to read/write these entries) may be found in the documentation for *wxConfigBase* (p. 162).

wxExpr overview

wxExpr is a C++ class reading and writing a subset of Prolog-like syntax, supporting objects attribute/value pairs.

wxExpr can be used to develop programs with readable and robust data files. Within wxWindows itself, it is used to parse the `.wxr` dialog resource files.

History of wxExpr

During the development of the tool Hardy within the AIAI, a need arose for a data file format for C++ that was easy for both humans and programs to read, was robust in the face of fast-moving software development, and that provided some compatibility with AI languages such as Prolog and LISP.

The result was the wxExpr library (formerly called PrologIO), which is able to read and write a Prolog-like attribute-value syntax, and is additionally capable of writing LISP syntax for no extra programming effort. The advantages of such a library are as follows:

1. The data files are readable by humans;
2. I/O routines are easier to write and debug compared with using binary files;
3. the files are robust: unrecognised data will just be ignored by the application
4. Inbuilt hashing gives a random access capability, useful for when linking up C++ objects as data is read in;
5. Prolog and LISP programs can load the files using a single command.

The library was extended to use the ability to read and write Prolog-like structures for remote procedure call (RPC) communication. The next two sections outline the two main ways the library can be used.

wxExpr for data file manipulation

The fact that the output is in Prolog syntax is irrelevant for most programmers, who just need a reasonable I/O facility. Typical output looks like this:

```
diagram_definition(type = "Spirit Belief Network").

node_definition(type = "Model",
  image_type = "Diamond",
  attribute_for_label = "name",
  attribute_for_status_line = "label",
  colour = "CYAN",
  default_width = 120,
  default_height = 80,
  text_size = 10,
  can_resize = 1,
```

```
  has_hypertext_item = 1,
  attributes = ["name", "combining_function", "level_of_belief"]).

arc_definition(type = "Potentially Confirming",
  image_type = "Spline",
  arrow_type = "End",
  line_style = "Solid",
  width = 1,
  segmentable = 0,
  attribute_for_label = "label",
  attribute_for_status_line = "label",
  colour = "BLACK",
  text_size = 10,
  has_hypertext_item = 1,
  can_connect_to = ["Evidence", "Cluster", "Model", "Evidence",
"Evidence", "Cluster"],
  can_connect_from = ["Data", "Evidence", "Cluster", "Evidence",
"Data", "Cluster"]).
```

This is substantially easier to read and debug than a series of numbers and strings.

Note the object-oriented style: a file comprises a series of *clauses*. Each clause is an object with a *functor* or object name, followed by a list of attribute-value pairs enclosed in parentheses, and finished with a full stop. Each attribute value may be a string, a word (no quotes), an integer, a real number, or a list with potentially recursive elements.

The way that the facility is used by an application to read in a file is as follows:

1. The application creates a wxExprDatabase instance.
2. The application tells the database to read in the entire file.
3. The application searches the database for objects it requires, decomposing the objects using the wxExpr API. The database may be hashed, allowing rapid linking-up of application data.
4. The application deletes or clears the wxExprDatabase.

Writing a file is just as easy:

1. The application creates a wxExprDatabase instance.
2. The application adds objects to the database using the API.
3. The application tells the database to write out the entire database, in Prolog or LISP notation.
4. The application deletes or clears the wxExprDatabase.

To use the library, include "wxexpr.h".

wxExpr compilation

For UNIX compilation, ensure that YACC and LEX or FLEX are on your system. Check that the makefile uses the correct programs: a common error is to compile y_tab.c with a C++ compiler. Edit the CCLEX variable in make.env to specify a C compiler. Also, do not attempt to compile lex_yy.c since it is included by y_tab.c.

For DOS compilation, the simplest thing is to copy dosyacc.c to y_tab.c, and doslex.c to lex_yy.c. It is y_tab.c that must be compiled (lex_yy.c is included by y_tab.c) so if adding source files to a project file, ONLY add y_tab.c plus the .cc files. If you wish to alter the parser, you will need YACC and FLEX on DOS.

The DOS tools are available at the AIAI ftp site, in the tools directory. Note that for FLEX installation, you need to copy flex.skl into the directory c:/lib.

If you are using Borland C++ and wish to regenerate lex_yy.c and y_tab.c you need to generate lex_yy.c with FLEX and then comment out the 'malloc' and 'free' prototypes in lex_yy.c. It will compile with lots of warnings. If you get an undefined _PROIO_YYWRAP symbol when you link, you need to remove USE_DEFINE from the makefile and recompile. This is because the parser.y file has a choice of defining this symbol as a function or as a define, depending on what the version of FLEX expects. See the bottom of parser.y, and if necessary edit it to make it compile in the opposite way to the current compilation.

Bugs

These are the known bugs:

1. Functors are permissible only in the main clause (object). Therefore nesting of structures must be done using lists, not predicates as in Prolog.
2. There is a limit to the size of strings read in (about 5000 bytes).

Using wxExpr

This section is a brief introduction to using the wxExpr package.

First, some terminology. A *wxExprDatabase* is a list of *clauses*, each of which represents an object or record which needs to be saved to a file. A clause has a *functor* (name), and a list of attributes, each of which has a value. Attributes may take the following types of value: string, word, integer, floating point number, and list. A list can itself contain any type, allowing for nested data structures.

Consider the following code.

```
wxExprDatabase db;

wxExpr *my_clause = new wxExpr("object");
my_clause->AddAttributeValue("id", (long)1);
my_clause->AddAttributeValueString("name", "Julian Smart");
db.Append(my_clause);

ofstream file("my_file");
db.Write(file);
```

This creates a database, constructs a clause, adds it to the database, and writes the

whole database to a file. The file it produces looks like this:

```
object(id = 1,
  name = "Julian Smart").
```

To read the database back in, the following will work:

```
wxExprDatabase db;
db.Read("my_file");

db.BeginFind();

wxExpr *my_clause = db.FindClauseByFunctor("object");
int id = 0;
wxString name = "None found";

my_clause->GetAttributeValue("id", id);
my_clause->GetAttributeValue("name", name);

cout << "Id is " << id << ", name is " << name << "\n";
```

Note the setting of defaults before attempting to retrieve attribute values, since they may not be found.

wxFileSystem

The wxHTML library uses a **virtual file systems** mechanism similar to the one used in Midnight Commander, Dos Navigator, FAR or almost any modern file manager. It allows the user to access data stored in archives as if they were ordinary files. On-the-fly generated files that exist only in memory are also supported.

Classes

Three classes are used in order to provide virtual file systems mechanism:

- The *wxFSFile* (p. 467) class provides information about opened file (name, input stream, mime type and anchor).
- The *wxFileSystem* (p. 425) class is the interface. Its main methods are ChangePathTo() and OpenFile(). This class is most often used by the end user.
- The *wxFileSystemHandler* (p. 427) is the core of virtual file systems mechanism. You can derive your own handler and pass it to of the VFS mechanism. You can derive your own handler and pass it to wxFileSystem's AddHandler() method. In the new handler you only need to override the OpenFile() and CanOpen() methods.

Locations

Locations (aka filenames aka addresses) are constructed from four parts:

- **protocol** - handler can recognize if it is able to open a file by checking its protocol. Examples are "http", "file" or "ftp".
- **right location** - is the name of file within the protocol. In "http://www.wxwindows.org/index.html" the right location is "//www.wxwindows.org/index.html".
- **anchor** - an anchor is optional and is usually not present. In "index.htm#chapter2" the anchor is "chapter2".
- **left location** - this is usually an empty string. It is used by 'local' protocols such as ZIP. See Combined Protocols paragraph for details.

Combined Protocols

The left location precedes the protocol in the URL string. It is not used by global protocols like HTTP but it becomes handy when nesting protocols - for example you may want to access files in a ZIP archive:

file:archives/cpp_doc.zip#zip:reference/fopen.htm#syntax

In this example, the protocol is "zip", the left location is "reference/fopen.htm", the anchor is "syntax" and the right location is "file:archives/cpp_doc.zip".

There are **two** protocols used in this example: "zip" and "file".

File Systems Included in wxHTML

The following virtual file system handlers are part of wxWindows so far:

wxInternetFSHandler   A handler for accessing documents via HTTP or FTP protocols. Include file is <wx/fs_inet.h>.

wxZipFSHandler   A handler for ZIP archives. Include file is <wx/fs_zip.h>. URL is in form "archive.zip#zip:filename".

wxMemoryFSHandler   This handler allows you to access data stored in memory (such as bitmaps) as if they were regular files. See *wxMemoryFSHandler documentation* (p. 684) for details. Include file is <wx/fs_mem.h>. UURL is prefixed with memory:, e.g. "memory:myfile.htm"

In addition, wxFileSystem itself can access local files.

Initializing file system handlers

Use *wxFileSystem::AddHandler* (p. 425) to initialize a handler, for example:

```
#include <wx/fs_mem.h>

...
```

```
bool MyApp::OnInit()
{
    wxFileSystem::AddHandler(new wxMemoryFSHandler);
...
}
```

Event handling overview

Classes: *wxEvtHandler* (p. 380), *wxWindow* (p. 1190), *wxEvent* (p. 377)

Introduction

Before version 2.0 of wxWindows, events were handled by the application either by supplying callback functions, or by overriding virtual member functions such as **OnSize**.

From wxWindows 2.0, *event tables* are used instead, with a few exceptions.

An event table is placed in an implementation file to tell wxWindows how to map events to member functions. These member functions are not virtual functions, but they all similar in form: they take a single wxEvent-derived argument, and have a void return type.

Here's an example of an event table.

```
BEGIN_EVENT_TABLE(MyFrame, wxFrame)
  EVT_MENU    (wxID_EXIT, MyFrame::OnExit)
  EVT_MENU    (DO_TEST,   MyFrame::DoTest)
  EVT_SIZE    (           MyFrame::OnSize)
  EVT_BUTTON  (BUTTON1,   MyFrame::OnButton1)
END_EVENT_TABLE()
```

The first two entries map menu commands to two different member functions. The EVT_SIZE macro doesn't need a window identifier, since normally you are only interested in the current window's size events. (In fact you could intercept a particular window's size event by using EVT_CUSTOM(wxEVT_SIZE, id, func).)

The EVT_BUTTON macro demonstrates that the originating event does not have to come from the window class implementing the event table - if the event source is a button within a panel within a frame, this will still work, because event tables are searched up through the hierarchy of windows. In this case, the button's event table will be searched, then the parent panel's, then the frame's.

As mentioned before, the member functions that handle events do not have to be virtual. Indeed, the member functions should not be virtual as the event handler ignores that the functions are virtual, i.e. overriding a virtual member function in a derived class will not have any effect. These member functions take an event argument, and the class of

event differs according to the type of event and the class of the originating window. For size events, *wxSizeEvent* (p. 928) is used. For menu commands and most control commands (such as button presses), *wxCommandEvent* (p. 153) is used. When controls get more complicated, then specific event classes are used, such as *wxTreeEvent* (p. 1156) for events from *wxTreeCtrl* (p. 1140) windows.

As well as the event table in the implementation file, there must be a DECLARE_EVENT_TABLE macro in the class definition. For example:

```
class MyFrame: public wxFrame {

  DECLARE_DYNAMIC_CLASS(MyFrame)

public:
  ...
  void OnExit(wxCommandEvent& event);
  void OnSize(wxSizeEvent& event);
protected:
  int        m_count;
  ...
  DECLARE_EVENT_TABLE()
};
```

How events are processed

When an event is received from the windowing system, wxWindows calls *wxEvtHandler::ProcessEvent* (p. 384) on the first event handler object belonging to the window generating the event.

It may be noted that wxWindows' event processing system implements something very close to virtual methods in normal C++, i.e. it is possible to alter the behaviour of a class by overriding its event handling functions. In many cases this works even for changing the behaviour of native controls. For example it is possible to filter out a number of key events sent by the system to a native text control by overriding wxTextCtrl and defining a handler for key events using EVT_KEY_DOWN. This would indeed prevent any key events from being sent to the native control - which might not be what is desired. In this case the event handler function has to call Skip() so as to indicate that the search for the event handler should continue.

To summarize, instead of explicitly calling the base class version as you would have done with C++ virtual functions (i.e. *wxTextCtrl::OnChar()*), you should instead call *Skip* (p. 380).

In practice, this would look like this if the derived text control only accepts 'a' to 'z' and 'A' to 'Z':

```
void MyTextCtrl::OnChar(wxKeyEvent& event)
{
    if ( isalpha( event.KeyCode() ) )
    {
```

```
      // key code is within legal range. we call event.Skip() so the
      // event can be processed either in the base wxWindows class
      // or the native control.

      event.Skip();
   }
   else
   {
      // illegal key hit. we don't call event.Skip() so the
      // event is not processed anywhere else.

      wxBell();
   }
}
```

The normal order of event table searching by ProcessEvent is as follows:

1. If the object is disabled (via a call to *wxEvtHandler::SetEvtHandlerEnabled* (p. 386)) the function skips to step (6).
2. If the object is a wxWindow, **ProcessEvent** is recursively called on the window's *wxValidator* (p. 1172). If this returns TRUE, the function exits.
3. **SearchEventTable** is called for this event handler. If this fails, the base class table is tried, and so on until no more tables exist or an appropriate function was found, in which case the function exits.
4. The search is applied down the entire chain of event handlers (usually the chain has a length of one). If this succeeds, the function exits.
5. If the object is a wxWindow and the event is a wxCommandEvent, **ProcessEvent** is recursively applied to the parent window's event handler. If this returns TRUE, the function exits.
6. Finally, **ProcessEvent** is called on the wxApp object.

Pay close attention to Step 5. People often overlook or get confused by this powerful feature of the wxWindows event processing system. To put it a different way, events derived either directly or indirectly from wxCommandEvent will travel up the containment hierarchy from child to parent until an event handler is found that doesn't call event.Skip(). Events not derived from wxCommandEvent are sent only to the window they occurred in and then stop.

Typically events that deal with a window as a window (size, motion, paint, mouse, keyboard, etc.) are sent only to the window. Events that have a higher level of meaning and/or are generated by the window itself, (button click, menu select, tree expand, etc.) are command events and are sent up to the parent to see if it is interested in the event.

Note that your application may wish to override ProcessEvent to redirect processing of events. This is done in the document/view framework, for example, to allow event handlers to be defined in the document or view. To test for command events (which will probably be the only events you wish to redirect), you may use wxEvent::IsCommandEvent for efficiency, instead of using the slower run-time type system.

As mentioned above, only command events are recursively applied to the parents event handler. As this quite often causes confusion for users, here is a list of system events

which will NOT get sent to the parent's event handler:

wxEvent (p. 377)	The event base class
wxActivateEvent (p. 20)	A window or application activation event
wxCloseEvent (p. 125)	A close window or end session event
wxEraseEvent (p. 376)	An erase background event
wxFocusEvent (p. 436)	A window focus event
wxKeyEvent (p. 610)	A keypress event
wxIdleEvent (p. 560)	An idle event
wxInitDialogEvent (p. 594)	A dialog initialisation event
wxJoystickEvent (p. 607)	A joystick event
wxMenuEvent (p. 711)	A menu event
wxMouseEvent (p. 725)	A mouse event
wxMoveEvent (p. 733)	A move event
wxPaintEvent (p. 764)	A paint event
wxQueryLayoutInfoEvent (p. 860)	Used to query layout information
wxSizeEvent (p. 928)	A size event
wxScrollWinEvent (p. 912)	A scroll event sent by a scrolled window (not a scroll bar)
wxSysColourChangedEvent (p. 1039)	A system colour change event
wxUpdateUIEvent (p. 1166)	A user interface update event

In some cases, it might be desired by the programmer to get a certain number of system events in a parent window, for example all key events sent to, but not used by, the native controls in a dialog. In this case, a special event handler will have to be written that will override ProcessEvent() in order to pass all events (or any selection of them) to the parent window.

Pluggable event handlers

In fact, you don't have to derive a new class from a window class if you don't want to. You can derive a new class from wxEvtHandler instead, defining the appropriate event table, and then call *wxWindow::SetEventHandler* (p. 1230) (or, preferably, *wxWindow::PushEventHandler* (p. 1224)) to make this event handler the object that responds to events. This way, you can avoid a lot of class derivation, and use the same event handler object to handle events from instances of different classes. If you ever have to call a window's event handler manually, use the GetEventHandler function to retrieve the window's event handler and use that to call the member function. By default, GetEventHandler returns a pointer to the window itself unless an application has redirected event handling using SetEventHandler or PushEventHandler.

One use of PushEventHandler is to temporarily or permanently change the behaviour of the GUI. For example, you might want to invoke a dialog editor in your application that changes aspects of dialog boxes. You can grab all the input for an existing dialog box, and edit it 'in situ', before restoring its behaviour to normal. So even if the application has derived new classes to customize behaviour, your utility can indulge in a spot of body-snatching. It could be a useful technique for on-line tutorials, too, where you take a user through a serious of steps and don't want them to diverge from the lesson. Here, you can examine the events coming from buttons and windows, and if acceptable, pass them

through to the original event handler. Use PushEventHandler/PopEventHandler to form a chain of event handlers, where each handler processes a different range of events independently from the other handlers.

Window identifiers

Window identifiers are integers, and are used to uniquely determine window identity in the event system (though you can use it for other purposes). In fact, identifiers do not need to be unique across your entire application just so long as they are unique within a particular context you're interested in, such as a frame and its children. You may use the wxID_OK identifier, for example, on any number of dialogs so long as you don't have several within the same dialog.

If you pass -1 to a window constructor, an identifier will be generated for you, but beware: if things don't respond in the way they should, it could be because of an id conflict. It is safer to supply window ids at all times. Automatic generation of identifiers starts at 1 so may well conflict with your own identifiers.

The following standard identifiers are supplied. You can use wxID_HIGHEST to determine the number above which it is safe to define your own identifiers. Or, you can use identifiers below wxID_LOWEST.

```
#define wxID_LOWEST             4999

#define wxID_OPEN               5000
#define wxID_CLOSE              5001
#define wxID_NEW                5002
#define wxID_SAVE               5003
#define wxID_SAVEAS             5004
#define wxID_REVERT             5005
#define wxID_EXIT               5006
#define wxID_UNDO               5007
#define wxID_REDO               5008
#define wxID_HELP               5009
#define wxID_PRINT              5010
#define wxID_PRINT_SETUP        5011
#define wxID_PREVIEW            5012
#define wxID_ABOUT              5013
#define wxID_HELP_CONTENTS      5014
#define wxID_HELP_COMMANDS      5015
#define wxID_HELP_PROCEDURES    5016
#define wxID_HELP_CONTEXT       5017

#define wxID_CUT                5030
#define wxID_COPY               5031
#define wxID_PASTE              5032
#define wxID_CLEAR              5033
#define wxID_FIND               5034
#define wxID_DUPLICATE          5035
#define wxID_SELECTALL          5036

#define wxID_FILE1              5050
#define wxID_FILE2              5051
```

```
#define wxID_FILE3              5052
#define wxID_FILE4              5053
#define wxID_FILE5              5054
#define wxID_FILE6              5055
#define wxID_FILE7              5056
#define wxID_FILE8              5057
#define wxID_FILE9              5058

#define wxID_OK                 5100
#define wxID_CANCEL             5101
#define wxID_APPLY              5102
#define wxID_YES                5103
#define wxID_NO                 5104
#define wxID_STATIC             5105

#define wxID_HIGHEST            5999
```

Event macros summary

Generic event table macros

EVT_CUSTOM(event, id, func)	Allows you to add a custom event table entry by specifying the event identifier (such as wxEVT_SIZE), the window identifier, and a member function to call.
EVT_CUSTOM_RANGE(event, id1, id2, func)	The same as EVT_CUSTOM, but responds to a range of window identifiers.
EVT_COMMAND(id, event, func)	The same as EVT_CUSTOM, but expects a member function with a wxCommandEvent argument.
EVT_COMMAND_RANGE(id1, id2, event, func)	The same as EVT_CUSTOM_RANGE, but expects a member function with a wxCommandEvent argument.

Macros listed by event class

The documentation for specific event macros is organised by event class. Please refer to these sections for details.

wxActivateEvent (p. 20)	The EVT_ACTIVATE and EVT_ACTIVATE_APP macros intercept activation and deactivation events.
wxCommandEvent (p. 153)	A range of commonly-used control events.
wxCloseEvent (p. 125)	The EVT_CLOSE macro handles window closure called via *wxWindow::Close* (p. 1195).
wxDropFilesEvent (p. 366)	The EVT_DROP_FILES macros handles

	file drop events.
wxEraseEvent (p. 376)	The EVT_ERASE_BACKGROUND macro is used to handle window erase requests.
wxFocusEvent (p. 436)	The EVT_SET_FOCUS and EVT_KILL_FOCUS macros are used to handle keyboard focus events.
wxKeyEvent (p. 610)	EVT_CHAR and EVT_CHAR_HOOK macros handle keyboard input for any window.
wxIdleEvent (p. 560)	The EVT_IDLE macro handle application idle events (to process background tasks, for example).
wxInitDialogEvent (p. 594)	The EVT_INIT_DIALOG macro is used to handle dialog initialisation.
wxListEvent (p. 648)	These macros handle *wxListCtrl* (p. 634) events.
wxMenuEvent (p. 711)	These macros handle special menu events (not menu commands).
wxMouseEvent (p. 725)	Mouse event macros can handle either individual mouse events or all mouse events.
wxMoveEvent (p. 733)	The EVT_MOVE macro is used to handle a window move.
wxPaintEvent (p. 764)	The EVT_PAINT macro is used to handle window paint requests.
wxScrollEvent (p. 914)	These macros are used to handle scroll events from *wxScrollBar* (p. 907), *wxSlider* (p. 934),and *wxSpinButton* (p. 967).
wxSizeEvent (p. 928)	The EVT_SIZE macro is used to handle a window resize.
wxSplitterEvent (p. 975)	The EVT_SPLITTER_SASH_POS_CHANGED, EVT_SPLITTER_UNSPLIT and EVT_SPLITTER_DOUBLECLICKED macros are used to handle the various splitter window events.
wxSysColourChangedEvent (p. 1039)	The EVT_SYS_COLOUR_CHANGED macro is used to handle events informing the application that the user has changed the system colours (Windows only).
wxTreeEvent (p. 1156)	These macros handle *wxTreeCtrl* (p. 1140) events.
wxUpdateUIEvent (p. 1166)	The EVT_UPDATE_UI macro is used to handle user interface update pseudo-events, which are generated to give the application the chance to update the visual state of menus, toolbars and controls.

Window styles

Window styles are used to specify alternative behaviour and appearances for windows, when they are created. The symbols are defined in such as way that they can be combined in a 'bit-list' using the C++ *bitwise-or* operator. For example:

```
wxCAPTION | wxMINIMIZE_BOX | wxMAXIMIZE_BOX | wxTHICK_FRAME
```

For the window styles specific to each window class, please see the documentation for the window. Most windows can use the generic styles listed for *wxWindow* (p. 1190) in addition to their own styles.

Window deletion overview

Classes: *wxCloseEvent* (p. 125), *wxWindow* (p. 1190)

Window deletion can be a confusing subject, so this overview is provided to help make it clear when and how you delete windows, or respond to user requests to close windows.

What is the sequence of events in a window deletion?

When the user clicks on the system close button or system close command, in a frame or a dialog, wxWindows calls *wxWindow::Close* (p. 1195). This in turn generates an EVT_CLOSE event: see *wxWindow::OnCloseWindow* (p. 1213).

It is the duty of the application to define a suitable event handler, and decide whether or not to destroy the window. If the application is for some reason forcing the application to close (*wxCloseEvent::CanVeto* (p. 125) returns FALSE), the window should always be destroyed, otherwise there is the option to ignore the request, or maybe wait until the user has answered a question before deciding whether it is safe to close. The handler for EVT_CLOSE should signal to the calling code if it does not destroy the window, by calling *wxCloseEvent::Veto* (p. 126). Calling this provides useful information to the calling code.

The wxCloseEvent handler should only call *wxWindow::Destroy* (p. 1198) to delete the window, and not use the **delete** operator. This is because for some window classes, wxWindows delays actual deletion of the window until all events have been processed, since otherwise there is the danger that events will be sent to a non-existent window.

As reinforced in the next section, calling Close does not guarantee that the window will be destroyed. Call *wxWindow::Destroy* (p. 1198) if you want to be certain that the window is destroyed.

How can the application close a window itself?

Your application can either use *wxWindow::Close* (p. 1195) event just as the framework does, or it can call *wxWindow::Destroy* (p. 1198) directly. If using Close(), you can pass a TRUE argument to this function to tell the event handler that we definitely want to delete the frame and it cannot be vetoed.

The advantage of using Close instead of Destroy is that it will call any clean-up code defined by the EVT_CLOSE handler; for example it may close a document contained in a window after first asking the user whether the work should be saved. Close can be vetoed by this process (return FALSE), whereas Destroy definitely destroys the window.

What is the default behaviour?

The default close event handler for wxDialog simulates a Cancel command, generating a wxID_CANCEL event. Since the handler for this cancel event might itself call **Close**, there is a check for infinite looping. The default handler for wxID_CANCEL hides the dialog (if modeless) or calls EndModal(wxID_CANCEL) (if modal). In other words, by default, the dialog *is not destroyed* (it might have been created on the stack, so the assumption of dynamic creation cannot be made).

The default close event handler for wxFrame destroys the frame using Destroy().

Under Windows, wxDialog defines a handler for *wxWindow::OnCharHook* (p. 1212) that generates a Cancel event if the Escape key has been pressed.

What should I do when the user calls up Exit from a menu?

You can simply call *wxWindow::Close* (p. 1195) on the frame. This will invoke your own close event handler which may destroy the frame.

You can do checking to see if your application can be safely exited at this point, either from within your close event handler, or from within your exit menu command handler. For example, you may wish to check that all files have been saved. Give the user a chance to save and quit, to not save but quit anyway, or to cancel the exit command altogether.

What should I do to upgrade my 1.xx OnClose to 2.0?

In wxWindows 1.xx, the **OnClose** function did not actually delete 'this', but signaled to the calling function (either **Close**, or the wxWindows framework) to delete or not delete the window.

To update your code, you should provide an event table entry in your frame or dialog, using the EVT_CLOSE macro. The event handler function might look like this:

```
void MyFrame::OnCloseWindow(wxCloseEvent& event)
{
  if (MyDataHasBeenModified())
  {
```

```
      wxMessageDialog* dialog = new wxMessageDialog(this,
        "Save changed data?", "My app", wxYES_NO|wxCANCEL);

      int ans = dialog->ShowModal();
      dialog->Destroy();

      switch (ans)
      {
        case wxID_YES:      // Save, then destroy, quitting app
          SaveMyData();
          this->Destroy();
          break;
        case wxID_NO:       // Don't save; just destroy, quitting app
          this->Destroy();
          break;
        case wxID_CANCEL:   // Do nothing - so don't quit app.
        default:
          if (!event.CanVeto()) // Test if we can veto this deletion
            this->Destroy();    // If not, destroy the window anyway.
          else
            event.Veto();       // Notify the calling code that we didn't
delete the frame.
          break;
      }
    }
  }
```

How do I exit the application gracefully?

A wxWindows application automatically exits when the designated top window, or the last frame or dialog, is destroyed. Put any application-wide cleanup code in *wxApp::OnExit* (p. 26) (this is a virtual function, not an event handler).

Do child windows get deleted automatically?

Yes, child windows are deleted from within the parent destructor. This includes any children that are themselves frames or dialogs, so you may wish to close these child frame or dialog windows explicitly from within the parent close handler.

What about other kinds of window?

So far we've been talking about 'managed' windows, i.e. frames and dialogs. Windows with parents, such as controls, don't have delayed destruction and don't usually have close event handlers, though you can implement them if you wish. For consistency, continue to use the *wxWindow::Destroy* (p. 1198) function instead of the **delete** operator when deleting these kinds of windows explicitly.

wxDialog overview

Classes: *wxDialog* (p. 312)

A dialog box is similar to a panel, in that it is a window which can be used for placing controls, with the following exceptions:

1. A surrounding frame is implicitly created.
2. Extra functionality is automatically given to the dialog box, such as tabbing between items (currently Windows only).
3. If the dialog box is *modal*, the calling program is blocked until the dialog box is dismissed.

Under Windows 3, modal dialogs have to be emulated using modeless dialogs and a message loop. This is because Windows 3 expects the contents of a modal dialog to be loaded from a resource file or created on receipt of a dialog initialization message. This is too restrictive for wxWindows, where any window may be created and displayed before its contents are created.

For a set of dialog convenience functions, including file selection, see *Dialog functions* (p. 1262).

See also *wxPanel* (p. 769) and *wxWindow* (p. 1190) for inherited member functions. Validation of data in controls is covered in *Validator overview* (p. 1382).

wxValidator overview

Classes: *wxValidator* (p. 1172), *wxTextValidator* (p. 1097), *wxGenericValidator* (p. 479)

The aim of the validator concept is to make dialogs very much easier to write. A validator is an object that can be plugged into a control (such as a wxTextCtrl), and mediates between C++ data and the control, transferring the data in either direction and validating it. It also is able to intercept events generated by the control, providing filtering behaviour without the need to derive a new control class.

You can use a stock validator, such as *wxTextValidator* (p. 1097) (which does text control data transfer, validation and filtering) and *wxGenericValidator* (p. 479) (which does data transfer for a range of controls); or you can write your own.

Example

Here is an example of wxTextValidator usage.

```
wxTextCtrl *txt1 = new wxTextCtrl(this, VALIDATE_TEXT, "",
  wxPoint(10, 10), wxSize(100, 80), 0,
  wxTextValidator(wxFILTER_ALPHA, &g_data.m_string));
```

In this example, the text validator object provides the following functionality:

1. It transfers the value of g_data.m_string (a wxString variable) to the wxTextCtrl when the dialog is initialised.

2. It transfers the wxTextCtrl data back to this variable when the dialog is dismissed.

3. It filters input characters so that only alphabetic characters are allowed.

The validation and filtering of input is accomplished in two ways. When a character is input, wxTextValidator checks the character against the allowed filter flag (wxFILTER_ALPHA in this case). If the character is inappropriate, it is vetoed (does not appear) and a warning beep sounds. The second type of validation is performed when the dialog is about to be dismissed, so if the default string contained invalid characters already, a dialog box is shown giving the error, and the dialog is not dismissed.

Anatomy of a validator

A programmer creating a new validator class should provide the following functionality.

A validator constructor is responsible for allowing the programmer to specify the kind of validation required, and perhaps a pointer to a C++ variable that is used for storing the data for the control. If such a variable address is not supplied by the user, then the validator should store the data internally.

The *wxValidator::Validate* (p. 1174) member function should return TRUE if the data in the control (not the C++ variable) is valid. It should also show an appropriate message if data was not valid.

The *wxValidator::TransferToWindow* (p. 1174) member function should transfer the data from the validator or associated C++ variable to the control.

The *wxValidator::TransferFromWindow* (p. 1174) member function should transfer the data from the control to the validator or associated C++ variable.

There should be a copy constructor, and a *wxValidator::Clone* (p. 1173) function which returns a copy of the validator object. This is important because validators are passed by reference to window constructors, and must therefore be cloned internally.

You can optionally define event handlers for the validator, to implement filtering. These handlers will capture events before the control itself does.

For an example implementation, see the valtext.h and valtext.cpp files in the wxWindows library.

How validators interact with dialogs

For validators to work correctly, validator functions must be called at the right times during dialog initialisation and dismissal.

When a *wxDialog::Show* (p. 319) is called (for a modeless dialog) or *wxDialog::ShowModal* (p. 320) is called (for a modal dialog), the function *wxWindow::InitDialog* (p. 1207) is automatically called. This in turn sends an initialisation event to the dialog. The default handler for the wxEVT_INIT_DIALOG event is defined in the wxWindow class to simply call the function *wxWindow::TransferDataToWindow* (p. 1238). This function finds all the validators in the window's children and calls the

TransferToWindow function for each. Thus, data is transferred from C++ variables to the dialog just as the dialog is being shown.

If you are using a window or panel instead of a dialog, you will need to call *wxWindow::InitDialog* (p. 1207) explicitly before showing the window.

When the user clicks on a button, for example the OK button, the application should first call *wxWindow::Validate* (p. 1239), which returns FALSE if any of the child window validators failed to validate the window data. The button handler should return immediately if validation failed. Secondly, the application should call *wxWindow::TransferDataFromWindow* (p. 1238) and return if this failed. It is then safe to end the dialog by calling EndModal (if modal) or Show (if modeless).

In fact, wxDialog contains a default command event handler for the wxID_OK button. It goes like this:

```
void wxDialog::OnOK(wxCommandEvent& event)
{
      if ( Validate() && TransferDataFromWindow() )
      {
        if ( IsModal() )
            EndModal(wxID_OK);
        else
        {
              SetReturnCode(wxID_OK);
              this->Show(FALSE);
        }
      }
}
```

So if using validators and a normal OK button, you may not even need to write any code for handling dialog dismissal.

If you load your dialog from a resource file, you will need to iterate through the controls setting validators, since validators can't be specified in a dialog resource.

Constraints overview

Classes: *wxLayoutConstraints* (p. 616), *wxIndividualLayoutConstraint* (p. 591).

Objects of class wxLayoutConstraint can be associated with a window to define the way it is laid out, with respect to its siblings or the parent.

The class consists of the following eight constraints of class wxIndividualLayoutConstraint, some or all of which should be accessed directly to set the appropriate constraints.

- **left:** represents the left hand edge of the window

- **right:** represents the right hand edge of the window
- **top:** represents the top edge of the window
- **bottom:** represents the bottom edge of the window
- **width:** represents the width of the window
- **height:** represents the height of the window
- **centreX:** represents the horizontal centre point of the window
- **centreY:** represents the vertical centre point of the window

The constraints are initially set to have the relationship wxUnconstrained, which means that their values should be calculated by looking at known constraints. To calculate the position and size of the control, the layout algorithm needs to know exactly 4 constraints (as it has 4 numbers to calculate from them), so you should always set exactly 4 of the constraints from the above table.

If you want the controls height or width to have the default value, you may use a special value for the constraint: wxAsIs. If the constraint is wxAsIs, the dimension will not be changed which is useful for the dialog controls which often have the default size (e.g. the buttons whose size is determined by their label).

The constrains calculation is done in *wxWindow::Layout* (p. 1209) function which evaluates constraints. To call it you can either call *wxWindow::SetAutoLayout* (p. 1227) if the parent window is a frame, panel or a dialog to tell default OnSize handlers to call Layout automatically whenever the window size changes, or override OnSize and call Layout yourself (note that you do have to call *Layout* (p. 1209) yourself if the parent window is not a frame, panel or dialog).

Constraint layout: more detail

By default, windows do not have a wxLayoutConstraints object. In this case, much layout must be done explicitly, by performing calculations in OnSize members, except for the case of frames that have exactly one subwindow (not counting toolbar and statusbar which are also positioned by the frame automatically), where wxFrame::OnSize takes care of resizing the child to always fill the frame.

To avoid the need for these rather awkward calculations, the user can create a wxLayoutConstraints object and associate it with a window with wxWindow::SetConstraints. This object contains a constraint for each of the window edges, two for the centre point, and two for the window size. By setting some or all of these constraints appropriately, the user can achieve quite complex layout by defining relationships between windows.

In wxWindows, each window can be constrained relative to either its *siblings* on the same window, or the *parent*. The layout algorithm therefore operates in a top-down manner, finding the correct layout for the children of a window, then the layout for the grandchildren, and so on. Note that this differs markedly from native Motif layout, where constraints can ripple upwards and can eventually change the frame window or dialog box size. We assume in wxWindows that the *user* is always 'boss' and specifies the size of the outer window, to which subwindows must conform. Obviously, this might be a limitation in some circumstances, but it suffices for most situations, and the simplification

avoids some of the nightmarish problems associated with programming Motif.

When the user sets constraints, many of the constraints for windows edges and dimensions remain unconstrained. For a given window, the wxWindow::Layout algorithm first resets all constraints in all children to have unknown edge or dimension values, and then iterates through the constraints, evaluating them. For unconstrained edges and dimensions, it tries to find the value using known relationships that always hold. For example, an unconstrained *width* may be calculated from the *left* and *right edges*, if both are currently known. For edges and dimensions with user-supplied constraints, these constraints are evaluated if the inputs of the constraint are known.

The algorithm stops when all child edges and dimension are known (success), or there are unknown edges or dimensions but there has been no change in this cycle (failure).

It then sets all the window positions and sizes according to the values it has found.

Because the algorithm is iterative, the order in which constraints are considered is irrelevant, however you may reduce the number of iterations (and thus speed up the layout calculations) by creating the controls in such order that as many constraints as possible can be calculated during the first iteration. For example, if you have 2 buttons which you'd like to position in the lower right corner, it is slightly more efficient to first create the second button and specify that its right border IsSameAs(parent, wxRight) and then create the first one by specifying that it should be LeftOf() the second one than to do in a more natural left-to-right order.

Window layout examples

Example 1: subwindow layout

This example specifies a panel and a window side by side, with a text subwindow below it.

```
  frame->panel = new wxPanel(frame, -1, wxPoint(0, 0), wxSize(1000,
500), 0);
  frame->scrollWindow = new MyScrolledWindow(frame, -1, wxPoint(0, 0),
wxSize(400, 400), wxRETAINED);
  frame->text_window = new MyTextWindow(frame, -1, wxPoint(0, 250),
wxSize(400, 250));

  // Set constraints for panel subwindow
  wxLayoutConstraints *c1 = new wxLayoutConstraints;

  c1->left.SameAs        (frame, wxLeft);
  c1->top.SameAs         (frame, wxTop);
  c1->right.PercentOf    (frame, wxWidth, 50);
  c1->height.PercentOf   (frame, wxHeight, 50);

  frame->panel->SetConstraints(c1);

  // Set constraints for scrollWindow subwindow
```

```
wxLayoutConstraints *c2 = new wxLayoutConstraints;

c2->left.SameAs        (frame->panel, wxRight);
c2->top.SameAs         (frame, wxTop);
c2->right.SameAs       (frame, wxRight);
c2->height.PercentOf   (frame, wxHeight, 50);

frame->scrollWindow->SetConstraints(c2);

// Set constraints for text subwindow
wxLayoutConstraints *c3 = new wxLayoutConstraints;
c3->left.SameAs        (frame, wxLeft);
c3->top.Below          (frame->panel);
c3->right.SameAs       (frame, wxRight);
c3->bottom.SameAs      (frame, wxBottom);

frame->text_window->SetConstraints(c3);
```

Example 2: panel item layout

This example sizes a button width to 80 percent of the panel width, and centres it horizontally. A listbox and multitext item are placed below it. The listbox takes up 40 percent of the panel width, and the multitext item takes up the remainder of the width. Margins of 5 pixels are used.

```
// Create some panel items
wxButton *btn1 = new wxButton(frame->panel, -1, "A button") ;

wxLayoutConstraints *b1 = new wxLayoutConstraints;
b1->centreX.SameAs    (frame->panel, wxCentreX);
b1->top.SameAs        (frame->panel, wxTop, 5);
b1->width.PercentOf   (frame->panel, wxWidth, 80);
b1->height.PercentOf  (frame->panel, wxHeight, 10);
btn1->SetConstraints(b1);

wxListBox *list = new wxListBox(frame->panel, -1, "A list",
                               wxPoint(-1, -1), wxSize(200, 100));

wxLayoutConstraints *b2 = new wxLayoutConstraints;
b2->top.Below         (btn1, 5);
b2->left.SameAs       (frame->panel, wxLeft, 5);
b2->width.PercentOf   (frame->panel, wxWidth, 40);
b2->bottom.SameAs     (frame->panel, wxBottom, 5);
list->SetConstraints(b2);

wxTextCtrl *mtext = new wxTextCtrl(frame->panel, -1, "Multiline
text", "Some text",
                       wxPoint(-1, -1), wxSize(150, 100),
wxTE_MULTILINE);

wxLayoutConstraints *b3 = new wxLayoutConstraints;
b3->top.Below         (btn1, 5);
b3->left.RightOf      (list, 5);
b3->right.SameAs      (frame->panel, wxRight, 5);
b3->bottom.SameAs     (frame->panel, wxBottom, 5);
```

```
mtext->SetConstraints(b3);
```

The wxWindows resource system

wxWindows has an optional *resource file* facility, which allows separation of dialog, menu, bitmap and icon specifications from the application code.

It is similar in principle to the Windows resource file (whose ASCII form is suffixed .RC and whose binary form is suffixed .RES). The wxWindows resource file is currently ASCII-only, suffixed .WXR. Note that under Windows, the .WXR file does not *replace* the native Windows resource file, it merely supplements it. There is no existing native resource format in X (except for the defaults file, which has limited expressive power).

For details of functions for manipulating resource files and loading user interface elements, see *wxWindows resource functions* (p. 1300).

You can use Dialog Editor to create resource files. Unfortunately neither Dialog Editor nor the .WXR format currently cover all wxWindows controls; some are missing, such as wxSpinCtrl, wxSpinButton, wxListCtrl, wxTreeCtrl and others.

Note that in later versions of wxWindows, this resource format will be replaced by XML specifications that can also include sizers.

The format of a .WXR file

A wxWindows resource file may look a little odd at first. It is C++ compatible, comprising mostly of static string variable declarations with wxExpr syntax within the string.

Here's a sample .WXR file:

```
/*
 * wxWindows Resource File
 *
 */

#include "noname.ids"

static char *my_resource = "bitmap(name = 'my_resource',\
  bitmap = ['myproject', wxBITMAP_TYPE_BMP_RESOURCE, 'WINDOWS'],\
  bitmap = ['myproject.xpm', wxBITMAP_TYPE_XPM, 'X']).";

static char *menuBar11 = "menu(name = 'menuBar11',\
  menu = \
  [\
    ['&File', 1, '', \
      ['&Open File', 2, 'Open a file'],\
      ['&Save File', 3, 'Save a file'],\
      [],\
```

```
        ['E&xit', 4, 'Exit program']\
    ],\
    ['&Help', 5, '', \
        ['&About', 6, 'About this program']\
    ]\
  ]).";

static char *project_resource = "icon(name = 'project_resource',\
  icon = ['project', wxBITMAP_TYPE_ICO_RESOURCE, 'WINDOWS'],\
  icon = ['project_data', wxBITMAP_TYPE_XBM, 'X']).";

static char *panel3 = "dialog(name = 'panel3',\
  style = '',\
  title = 'untitled',\
  button_font = [14, 'wxSWISS', 'wxNORMAL', 'wxBOLD', 0],\
  label_font = [10, 'wxSWISS', 'wxNORMAL', 'wxNORMAL', 0],\
  x = 0, y = 37, width = 292, height = 164,\
  control = [1000, wxButton, 'OK', '', 'button5', 23, 34, -1, -1,
'my_resource'],\
  control = [1001, wxStaticText, 'A Label', '', 'message7', 166, 61, -
1, -1, 'my_resource'],\
  control = [1002, wxTextCtrl, 'Text', 'wxTE_MULTITEXT', 'text8', 24,
110, -1, -1]).";
```

As you can see, C++-style comments are allowed, and apparently include files are supported too: but this is a special case, where the included file is a file of defines shared by the C++ application code and resource file to relate identifiers (such as FILE_OPEN) to integers.

Each *resource object* is of standard *wxExpr* (p. 388) syntax, that is, an object name such as **dialog** or **icon**, then an open parenthesis, a list of comma-delimited attribute/value pairs, a closing parenthesis, and a full stop. Backslashes are required to escape newlines, for the benefit of C++ syntax. If double quotation marks are used to delimit strings, they need to be escaped with backslash within a C++ string (so it is easier to use single quotation marks instead).

> *A note on string syntax:* A string that begins with an alphabetic character, and contains only alphanumeric characters, hyphens and underscores, need not be quoted at all. Single quotes and double quotes may be used to delimit more complex strings. In fact, single-quoted and no-quoted strings are actually called *words*, but are treated as strings for the purpose of the resource system.

A resource file like this is typically included in the application main file, as if it were a normal C++ file. This eliminates the need for a separate resource file to be distributed alongside the executable. However, the resource file can be dynamically loaded if desired (useful for non-C++ languages such as Python).

Once included, the resources need to be 'parsed' (interpreted), because so far the data is just a number of static string variables. The function **::wxResourceParseData** is called early on in initialization of the application (usually in **wxApp::OnInit**) with a variable as argument. This may need to be called a number of times, one for each variable. However, more than one resource 'object' can be stored in one string variable at a time, so you can get all your resources into one variable if you want to.

::wxResourceParseData parses the contents of the resource, ready for use by functions such as **::wxResourceCreateBitmap** and **wxPanel::LoadFromResource**.

If a wxWindows resource object (such as a bitmap resource) refers to a C++ data structure, such as static XPM data, a further call (**::wxResourceRegisterBitmapData**) needs to be made on initialization to tell wxWindows about this data. The wxWindows resource object will refer to a string identifier, such as 'project_data' in the example file above. This identifier will be looked up in a table to get the C++ static data to use for the bitmap or icon.

In the C++ fragment below, the WXR resource file is included, and appropriate resource initialization is carried out in **OnInit**. Note that at this stage, no actual wxWindows dialogs, menus, bitmaps or icons are created; their 'templates' are merely being set up for later use.

```
/*
 * File:    project.cpp
 * Purpose: main application module
 */

#include "wx/wx.h"
#include "project.h"

// Includes the dialog, menu etc. resources
#include "project.wxr"

// Includes XPM data
#include "project.xpm"

IMPLEMENT_APP(AppClass)

// Called to initialize the program
bool AppClass::OnInit()
{
  wxResourceRegisterBitmapData("project_data", project_bits,
project_width, project_height);

  wxResourceParseData(menuBar11);
  wxResourceParseData(my_resource);
  wxResourceParseData(project_resource);
  wxResourceParseData(panel3);
  ...

  return TRUE;
}
```

The following code shows a dialog:

```
  // project.wxr contains dialog1
  MyDialog *dialog = new MyDialog;
  if (dialog->LoadFromResource(this, "dialog1"))
  {
    wxTextCtrl *text = (wxTextCtrl *)wxFindWindowByName("text3",
```

```
dialog);
    if (text)
      text->SetValue("wxWindows resource demo");
    dialog->ShowModal();
  }
  dialog->Destroy();
```

Please see also the resource sample.

Dialog resource format

A dialog resource object may be used for either panels or dialog boxes, and consists of the following attributes. In the following, a *font specification* is a list consisting of point size, family, style, weight, underlined, optional facename.

Attribute	Value
id	The integer identifier of the resource.
name	The name of the resource.
style	Optional dialog box or panel window style.
title	The title of the dialog box (unused if a panel).
.modal	Whether modal: 1 if modal, 0 if modeless, absent if a panel resource.
use_dialog_units	If 1, use dialog units (dependent on the dialog font size) for control sizes and positions.
use_system_defaults	If 1, override colours and fonts to use system settings instead.
button_font	The font used for control buttons: a list comprising point size (integer), family (string), font style (string), font weight (string) and underlining (0 or 1).
label_font	The font used for control labels: a list comprising point size (integer), family (string), font style (string), font weight (string) and underlining (0 or 1). Now obsolete; use button_font instead.
x	The x position of the dialog or panel.
y	The y position of the dialog or panel.
width	The width of the dialog or panel.
height	The height of the dialog or panel.
background_colour	The background colour of the dialog or panel.
label_colour	The default label colour for the children of the dialog or panel. Now obsolete; use button_colour instead.
button_colour	The default button text colour for the children of the dialog or panel.

Then comes zero or more attributes named 'control' for each control (panel item) on the dialog or panel. The value is a list of further elements. In the table below, the names in the first column correspond to the first element of the value list, and the second column details the remaining elements of the list. Note that titles for some controls are obsolete (they don't have titles), but the syntax is retained for backward compatibility.

Control	Values
wxButton	id (integer), title (string), window style (string), name (string), x, y, width, height, button bitmap resource (optional string), button font spec
wxCheckBox	id (integer), title (string), window style (string), name (string), x, y, width, height, default value (optional integer, 1 or 0), label font spec
wxChoice	id (integer), title (string), window style (string), name (string), x, y, width, height, values (optional list of strings), label font spec, button font spec
wxComboBox	id (integer), title (string), window style (string), name (string), x, y, width, height, default text value, values (optional list of strings), label font spec, button font spec
wxGauge	id (integer), title (string), window style (string), name (string), x, y, width, height, value (optional integer), range (optional integer), label font spec, button font spec
wxStaticBox	id (integer), title (string), window style (string), name (string), x, y, width, height, label font spec
wxListBox	id (integer), title (string), window style (string), name (string), x, y, width, height, values (optional list of strings), multiple (optional string, wxSINGLE or wxMULTIPLE), label font spec, button font spec
wxStaticText	id (integer), title (string), window style (string), name (string), x, y, width, height, message bitmap resource (optional string), label font spec
wxRadioBox	id (integer), title (string), window style (string), name (string), x, y, width, height, values (optional list of strings), number of rows or cols, label font spec, button font spec
wxRadioButton	id (integer), title (string), window style (string), name (string), x, y, width, height, default value (optional integer, 1 or 0), label font spec
wxScrollBar	id (integer), title (string), window style

	(string), name (string), x, y, width, height, value (optional integer), page length (optional integer), object length (optional integer), view length (optional integer)
wxSlider	id (integer), title (string), window style (string), name (string), x, y, width, height, value (optional integer), minimum (optional integer), maximum (optional integer), label font spec, button font spec
wxTextCtrl	id (integer), title (string), window style (string), name (string), x, y, width, height, default value (optional string), label font spec, button font spec

Menubar resource format

A menubar resource object consists of the following attributes.

Attribute	Value
name	The name of the menubar resource.
menu	A list containing all the menus, as detailed below.

The value of the **menu** attribute is a list of menu item specifications, where each menu item specification is itself a list comprising:

- title (a string)
- menu item identifier (a string or non-zero integer, see below)
- help string (optional)
- 0 or 1 for the 'checkable' parameter (optional)
- optionally, further menu item specifications if this item is a pulldown menu.

If the menu item specification is the empty list ([]), this is interpreted as a menu separator.

If further (optional) information is associated with each menu item in a future release of wxWindows, it will be placed after the help string and before the optional pulldown menu specifications.

Note that the menu item identifier must be an integer if the resource is being included as C++ code and then parsed on initialisation. Unfortunately, #define substitution is not performed inside strings, and therefore the program cannot know the mapping. However, if the .WXR file is being loaded dynamically, wxWindows will attempt to replace string identifiers with #defined integers, because it is able to parse the included #defines.

Bitmap resource format

A bitmap resource object consists of a name attribute, and one or more **bitmap** attributes. There can be more than one of these to allow specification of bitmaps that are optimum for the platform and display.

- Bitmap name or filename.
- Type of bitmap; for example, wxBITMAP_TYPE_BMP_RESOURCE. See class reference under **wxBitmap** for a full list).
- Platform this bitmap is valid for; one of WINDOWS, X, MAC and ANY.
- Number of colours (optional).
- X resolution (optional).
- Y resolution (optional).

Icon resource format

An icon resource object consists of a name attribute, and one or more **icon** attributes. There can be more than one of these to allow specification of icons that are optimum for the platform and display.

- Icon name or filename.
- Type of icon; for example, wxBITMAP_TYPE_ICO_RESOURCE. See class reference under **wxBitmap** for a full list).
- Platform this bitmap is valid for; one of WINDOWS, X, MAC and ANY.
- Number of colours (optional).
- X resolution (optional).
- Y resolution (optional).

Resource format design issues

The .WXR file format is a recent addition and subject to change. The use of an ASCII resource file format may seem rather inefficient, but this choice has a number of advantages:

- Since it is C++ compatible, it can be included into an application's source code, eliminating the problems associated with distributing a separate resource file with the executable. However, it can also be loaded dynamically from a file, which will be required for non-C++ programs that use wxWindows.
- No extra binary file format and separate converter need be maintained for the wxWindows project (although others are welcome to add the equivalent of the Windows 'rc' resource parser and a binary format).
- It would be difficult to append a binary resource component onto an executable in a portable way.
- The file format is essentially the *wxExpr* (p. 388) object format, for which a parser already exists, so parsing is easy. For those programs that use wxExpr anyway, the size overhead of the parser is minimal.

The disadvantages of the approach include:

- Parsing adds a small execution overhead to program initialization.
- Under 16-bit Windows especially, global data is at a premium. Using a .RC resource table for some wxWindows resource data may be a partial solution, although .RC strings are limited to 255 characters.
- Without a resource preprocessor, it is not possible to substitute integers for identifiers (so menu identifiers have to be written as integers in the resource object, in addition to providing #defines for application code convenience).

Compiling the resource system

To enable the resource system, set **wxUSE_WX_RESOURCES** to 1 in setup.h.

Scrolling overview

Classes: *wxWindow* (p. 1190), *wxScrolledWindow* (p. 916), *wxIcon* (p. 562), *wxScrollBar* (p. 907).

Scrollbars come in various guises in wxWindows. All windows have the potential to show a vertical scrollbar and/or a horizontal scrollbar: it is a basic capability of a window. However, in practice, not all windows do make use of scrollbars, such as a single-line wxTextCtrl.

Because any class derived from *wxWindow* (p. 1190) may have scrollbars, there are functions to manipulate the scrollbars and event handlers to intercept scroll events. But just because a window generates a scroll event, doesn't mean that the window necessarily handles it and physically scrolls the window. The base class wxWindow in fact doesn't have any default functionality to handle scroll events. If you created a wxWindow object with scrollbars, and then clicked on the scrollbars, nothing at all would happen. This is deliberate, because the *interpretation* of scroll events varies from one window class to another.

wxScrolledWindow (p. 916) (formerly wxCanvas) is an example of a window that adds functionality to make scrolling really work. It assumes that scrolling happens in consistent units, not different-sized jumps, and that page size is represented by the visible portion of the window. It is suited to drawing applications, but perhaps not so suitable for a sophisticated editor in which the amount scrolled may vary according to the size of text on a given line. For this, you would derive from wxWindow and implement scrolling yourself. *wxGrid* (p. 481) is an example of a class that implements its own scrolling, largely because columns and rows can vary in size.

The scrollbar model

The function *wxWindow::SetScrollbar* (p. 1232) gives a clue about the way a scrollbar is modeled. This function takes the following arguments:

orientation	Which scrollbar: wxVERTICAL or wxHORIZONTAL.
position	The position of the scrollbar in scroll units.
visible	The size of the visible portion of the scrollbar, in scroll units.
range	The maximum position of the scrollbar.
refresh	Whether the scrollbar should be repainted.

orientation determines whether we're talking about the built-in horizontal or vertical scrollbar.

position is simply the position of the 'thumb' (the bit you drag to scroll around). It is given in scroll units, and so is relative to the total range of the scrollbar.

visible gives the number of scroll units that represents the portion of the window currently visible. Normally, a scrollbar is capable of indicating this visually by showing a different length of thumb.

range is the maximum value of the scrollbar, where zero is the start position. You choose the units that suit you, so if you wanted to display text that has 100 lines, you would set this to 100. Note that this doesn't have to correspond to the number of pixels scrolled - it is up to you how you actually show the contents of the window.

refresh just indicates whether the scrollbar should be repainted immediately or not.

An example

Let's say you wish to display 50 lines of text, using the same font. The window is sized so that you can only see 16 lines at a time.

You would use:

```
SetScrollbar(wxVERTICAL, 0, 16, 50);
```

Note that with the window at this size, the thumb position can never go above 50 minus 16, or 34.

You can determine how many lines are currently visible by dividing the current view size by the character height in pixels.

When defining your own scrollbar behaviour, you will always need to recalculate the scrollbar settings when the window size changes. You could therefore put your scrollbar calculations and SetScrollbar call into a function named AdjustScrollbars, which can be

called initially and also from your *wxWindow::OnSize* (p. 1222) event handler function.

Bitmaps and icons overview

Classes: *wxBitmap* (p. 54), *wxBitmapHandler* (p. 66), *wxIcon* (p. 562), *wxCursor* (p. 184).

The wxBitmap class encapsulates the concept of a platform-dependent bitmap, either monochrome or colour. Platform-specific methods for creating a wxBitmap object from an existing file are catered for, and this is an occasion where conditional compilation will sometimes be required.

A bitmap created dynamically or loaded from a file can be selected into a memory device context (instance of *wxMemoryDC* (p. 682)). This enables the bitmap to be copied to a window or memory device context using *wxDC::Blit* (p. 283), or to be used as a drawing surface. The **wxToolBarSimple** class is implemented using bitmaps, and the toolbar demo shows one of the toolbar bitmaps being used for drawing a miniature version of the graphic which appears on the main window.

See *wxMemoryDC* (p. 682) for an example of drawing onto a bitmap.

The following shows the conditional compilation required to load a bitmap under Unix and in Windows. The alternative is to use the string version of the bitmap constructor, which loads a file under Unix and a resource or file under Windows, but has the disadvantage of requiring the XPM icon file to be available at run-time.

```
#if defined(__WXGTK__) || defined(__WXMOTIF__)
#include "mondrian.xpm"
#endif
```

A macro, *wxICON* (p. 1298), is available which creates an icon using an XPM on the appropriate platform, or an icon resource on Windows.

```
wxIcon icon(wxICON(mondrian));

// Equivalent to:

#if defined(__WXGTK__) || defined(__WXMOTIF__)
wxIcon icon(mondrian_xpm);
#endif

#if defined(__WXMSW__)
wxIcon icon("mondrian");
#endif
```

There is also a corresponding *wxBITMAP* (p. 1297) macro which allows to create the bitmaps in much the same way as *wxICON* (p. 1298) creates icons. It assumes that bitmaps live in resources under Windows or OS2 and XPM files under all other platforms (for XPMs, the corresponding file must be included before this macro is used, of course,

and the name of the bitmap should be the same as the resource name under Windows with _xpmsuffix). For example:

```
// an easy and portable way to create a bitmap
wxBitmap bmp(wxBITMAP(bmpname));

// which is roughly equivalent to the following
#if defined(__WXMSW__) || defined(__WXPM__)
    wxBitmap bmp("bmpname", wxBITMAP_TYPE_RESOURCE);
#else // Unix
    wxBitmap bmp(bmpname_xpm, wxBITMAP_TYPE_XPM);
#endif
```

You should always use wxICON and wxBITMAP macros because they work for any platform (unlike the code above which doesn't deal with wxMac, wxBe, ...) and are more short and clear than versions with `#ifdef`s.

Supported bitmap file formats

The following lists the formats handled on different platforms. Note that missing or partially-implemented formats are automatically supplemented by the *wxImage* (p. 569) to load the data, and then converting it to wxBitmap form. Note that using wxImage is the preferred way to load images in wxWindows, with the exception of resources (XPM-files or native Windows resources). Writing an image format handler for wxImage is also far easier than writing one for wxBitmap, because wxImage has exactly one format on all platforms whereas wxBitmap can store pixel data very differently, depending on colour depths and platform.

wxBitmap

Under Windows, wxBitmap may load the following formats:

- Windows bitmap resource (wxBITMAP_TYPE_BMP_RESOURCE)
- Windows bitmap file (wxBITMAP_TYPE_BMP)
- XPM data and file (wxBITMAP_TYPE_XPM)
- All formats that are supported by the *wxImage* (p. 569) class.

Under wxGTK, wxBitmap may load the following formats:

- XPM data and file (wxBITMAP_TYPE_XPM)
- All formats that are supported by the *wxImage* (p. 569) class.

Under wxMotif, wxBitmap may load the following formats:

- XBM data and file (wxBITMAP_TYPE_XBM)
- XPM data and file (wxBITMAP_TYPE_XPM)
- All formats that are supported by the *wxImage* (p. 569) class.

wxIcon

Under Windows, wxIcon may load the following formats:

- Windows icon resource (wxBITMAP_TYPE_ICO_RESOURCE)
- Windows icon file (wxBITMAP_TYPE_ICO)
- XPM data and file (wxBITMAP_TYPE_XPM)

Under wxGTK, wxIcon may load the following formats:

- XPM data and file (wxBITMAP_TYPE_XPM)
- All formats that are supported by the *wxImage* (p. 569) class.

Under wxMotif, wxIcon may load the following formats:

- XBM data and file (wxBITMAP_TYPE_XBM)
- XPM data and file (wxBITMAP_TYPE_XPM)
- All formats that are supported by the *wxImage* (p. 569) class (?).

wxCursor

Under Windows, wxCursor may load the following formats:

- Windows cursor resource (wxBITMAP_TYPE_CUR_RESOURCE)
- Windows cursor file (wxBITMAP_TYPE_CUR)
- Windows icon file (wxBITMAP_TYPE_ICO)
- Windows bitmap file (wxBITMAP_TYPE_BMP)

Under wxGTK, wxCursor may load the following formats (in additional to stock cursors):

- None (stock cursors only).

Under wxMotif, wxCursor may load the following formats:

- XBM data and file (wxBITMAP_TYPE_XBM)

Bitmap format handlers

To provide extensibility, the functionality for loading and saving bitmap formats is not implemented in the wxBitmap class, but in a number of handler classes, derived from wxBitmapHandler. There is a static list of handlers which wxBitmap examines when a file load/save operation is requested. Some handlers are provided as standard, but if you have special requirements, you may wish to initialise the wxBitmap class with some extra handlers which you write yourself or receive from a third party.

To add a handler object to wxBitmap, your application needs to include the header which implements it, and then call the static function *wxBitmap::AddHandler* (p. 58). For example:

```
#include <wx/xpmhand.h>
```

```
...
// Initialisation
wxBitmap::AddHandler(new wxXPMFileHandler);
wxBitmap::AddHandler(new wxXPMDataHandler);
...
```

Assuming the handlers have been written correctly, you should now be able to load and save XPM files using the usual wxBitmap API.

Note: bitmap handlers are not implemented on all platforms. Currently, the above is only necessary on Windows, to save the extra overhead of formats that may not be necessary (if you don't use them, they are not linked into the executable). Unix platforms have XPM capability built-in (where supported).

Also, just because a handler (such as a PNG handler) is not present does not mean that wxBitmap does not support that file format. If wxBitmap fails to find a suitable handler, the file-loading capabilities of wxImage are used instead.

Device context overview

Classes: *wxDC* (p. 282), *wxPostScriptDC* (p. 791), *wxMetafileDC* (p. 716), *wxMemoryDC* (p. 682), *wxPrinterDC* (p. 810), *wxScreenDC* (p. 906), *wxClientDC* (p. 121), *wxPaintDC* (p. 763), *wxWindowDC* (p. 1240).

A wxDC is a *device context* onto which graphics and text can be drawn. The device context is intended to represent a number of output devices in a generic way, with the same API being used throughout.

Some device contexts are created temporarily in order to draw on a window. This is true of *wxScreenDC* (p. 906), *wxClientDC* (p. 121), *wxPaintDC* (p. 763), and *wxWindowDC* (p. 1240). The following describes the differences between these device contexts and when you should use them.

- **wxScreenDC.** Use this to paint on the screen, as opposed to an individual window.
- **wxClientDC.** Use this to paint on the client area of window (the part without borders and other decorations), but do not use it from within an *wxWindow::OnPaint* (p. 1219) event.
- **wxPaintDC.** Use this to paint on the client area of a window, but *only* from within an *wxWindow::OnPaint* (p. 1219) event.
- **wxWindowDC.** Use this to paint on the whole area of a window, including decorations. This may not be available on non-Windows platforms.

To use a client, paint or window device context, create an object on the stack with the window as argument, for example:

```
void MyWindow::OnMyCmd(wxCommandEvent& event)
{
  wxClientDC dc(window);
  DrawMyPicture(dc);
}
```

Try to write code so it is parameterised by wxDC - if you do this, the same piece of code may write to a number of different devices, by passing a different device context. This doesn't work for everything (for example not all device contexts support bitmap drawing) but will work most of the time.

wxFont overview

Class: *wxFont* (p. 437)

A font is an object which determines the appearance of text, primarily when drawing text to a window or device context. A font is determined by the following parameters (not all of them have to be specified, of course):

Point size	This is the standard way of referring to text size.
Family	Supported families are: **wxDEFAULT, wxDECORATIVE, wxROMAN, wxSCRIPT, wxSWISS, wxMODERN**. **wxMODERN** is a fixed pitch font; the others are either fixed or variable pitch.
Style	The value can be **wxNORMAL, wxSLANT** or **wxITALIC**.
Weight	The value can be **wxNORMAL, wxLIGHT** or **wxBOLD**.
Underlining	The value can be TRUE or FALSE.
Face name	An optional string specifying the actual typeface to be used. If NULL, a default typeface will chosen based on the family.
Encoding	The font encoding (see **wxFONTENCODING_XXX** constants and the *font overview* (p. 1402) for more details)

Specifying a family, rather than a specific typeface name, ensures a degree of portability across platforms because a suitable font will be chosen for the given font family.

Under Windows, the face name can be one of the installed fonts on the user's system. Since the choice of fonts differs from system to system, either choose standard Windows fonts, or if allowing the user to specify a face name, store the family id with any file that might be transported to a different Windows machine or other platform.

Note: There is currently a difference between the appearance of fonts on the two platforms, if the mapping mode is anything other than wxMM_TEXT. Under X, font size is always specified in points. Under MS Windows, the unit for text is points but the text is scaled according to the current mapping mode. However, user scaling on a device context will also scale fonts under both environments.

Font encoding overview

wxWindows has support for multiple font encodings starting from release 2.2. By encoding we mean here the mapping between the character codes and the letters. Probably the most well-known encoding is (7 bit) ASCII one which is used almost universally now to represent the letters of the English alphabet and some other common characters. However, it is not enough to represent the letters of foreign alphabets and here other encodings come into play. Please note that we will only discuss 8-bit fonts here and not *Unicode* (p. 1347).

Font encoding support is assured by several classes: *wxFont* (p. 437) itself, but also *wxFontEnumerator* (p. 448) and *wxFontMapper* (p. 451). wxFont encoding support is reflected by a (new) constructor parameter *encoding* which takes one of the following values (elements of enumeration type `wxFontEncoding`):

wxFONTENCODING_SYSTEM	The default encoding of the underlying operating system (notice that this might be a "foreign" encoding for foreign versions of Windows 9x/NT).
wxFONTENCODING_DEFAULT	The applications default encoding as returned by *wxFont::GetDefaultEncoding* (p. 439). On program startup, the applications default encoding is the same as wxFONTENCODING_SYSTEM, but may be changed to make all the fonts created later to use it (by default).
wxFONTENCODING_ISO8859_1..15	ISO8859 family encodings which are usually used by all non-Microsoft operating systems
wxFONTENCODING_KOI8	Standard Cyrillic encoding for the Internet (but see also wxFONTENCODING_ISO8859_5 and wxFONTENCODING_CP1251)
wxFONTENCODING_CP1250	Microsoft analogue of ISO8859-2
wxFONTENCODING_CP1251	Microsoft analogue of ISO8859-5
wxFONTENCODING_CP1252	Microsoft analogue of ISO8859-1

As you may see, Microsoft's encoding partly mirror the standard ISO8859 ones, but there are (minor) differences even between ISO8859-1 (Latin1, ISO encoding for Western Europe) and CP1251 (WinLatin1, standard code page for English versions of Windows) and there are more of them for other encodings.

The situation is particularly complicated with Cyrillic encodings for which (more than) three incompatible encodings exist: KOI8 (the old standard, widely used on the Internet), ISO8859-5 (ISO standard for Cyrillic) and CP1251 (WinCyrillic).

This abundance of (incompatible) encoding:w s should make it clear that using encodings is less easy than it might seem. The problems arise both from the fact that the standard encodings for the given language (say Russian, which is written in Cyrillic) are different on differe nt platforms and because the fonts in the given encoding might just

not be installed (this is especially a problem with Unix, or, in general, not Win32, systems).

To allow to see clearer in this, *wxFontEnumerator* (p. 448) class may be used to enumerate both all available encodings and to find the facename(s) in which the given encoding exists. If you can find the font in the correct encoding with wxFontEnumerator then your troubles are over, but, unfortunately, sometimes this is not enough. For example, there is no standard way (I know of, please tell me if you do!) to find a font on a Windows system for KOI8 encoding (only for WinCyrillic one which is quite different), so *wxFontEnumerator* (p. 448) will never return one, even if the user has installed a KOI8 font on his system.

To solve this problem, a *wxFontMapper* (p. 451) class is provided. This class stores the mapping between the encodings and the font face names which support them in *wxConfig* (p. 1366) object. Of course, it would be fairly useless if it tried to determine these mappings by itself, so, instead, it (optionally) ask the user and remember his answers so that the next time the program will automatically choose the correct font.

All these topics are illustrated by the *font sample* (p. 1330), please refer to it and the documentation of the classes mentioned here for further explanations.

wxSplitterWindow overview

Classes: *wxSplitterWindow* (p. 978)

The following screenshot shows the appearance of a splitter window with a vertical split.
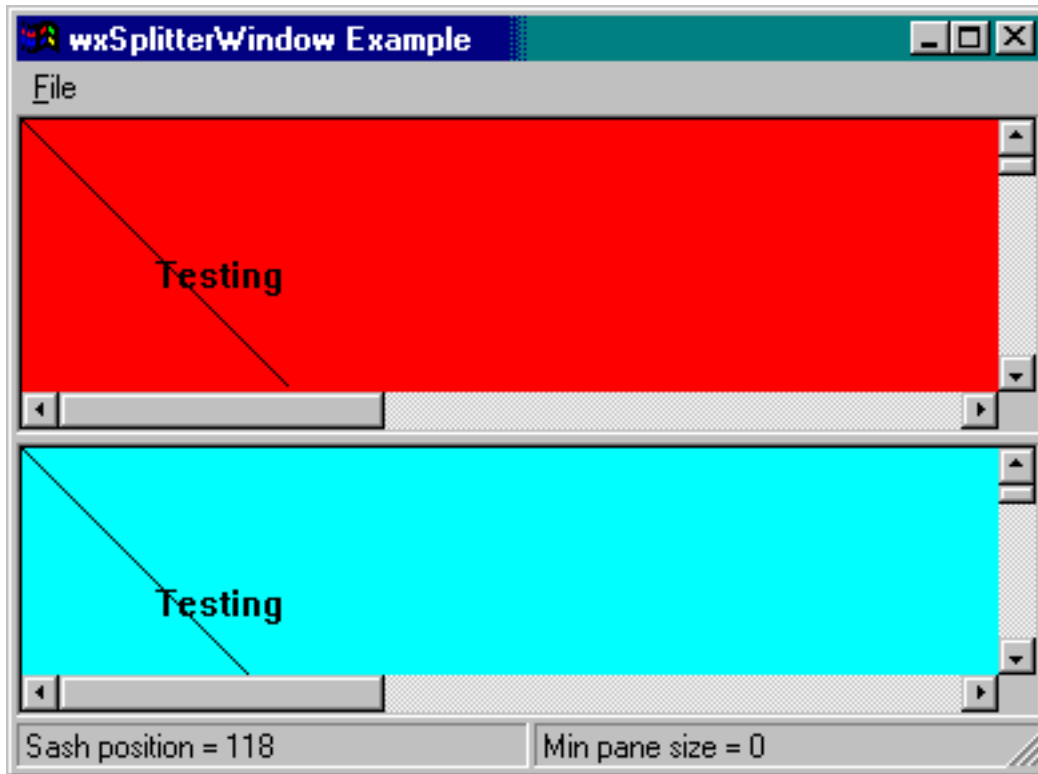
The style wxSP_3D has been used to show a 3D border and 3D sash.

Example

The following fragment shows how to create a splitter window, creating two subwindows and hiding one of them.

```
  splitter = new wxSplitterWindow(this, -1, wxPoint(0, 0), wxSize(400,
400), wxSP_3D);

  leftWindow = new MyWindow(splitter);
  leftWindow->SetScrollbars(20, 20, 50, 50);

  rightWindow = new MyWindow(splitter);
  rightWindow->SetScrollbars(20, 20, 50, 50);
  rightWindow->Show(FALSE);

  splitter->Initialize(leftWindow);

  // Set this to prevent unsplitting
//    splitter->SetMinimumPaneSize(20);
```

The next fragment shows how the splitter window can be manipulated after creation.

```
void MyFrame::OnSplitVertical(wxCommandEvent& event)
{
      if ( splitter->IsSplit() )
          splitter->Unsplit();
      leftWindow->Show(TRUE);
      rightWindow->Show(TRUE);
      splitter->SplitVertically( leftWindow, rightWindow );
}

void MyFrame::OnSplitHorizontal(wxCommandEvent& event)
{
      if ( splitter->IsSplit() )
          splitter->Unsplit();
      leftWindow->Show(TRUE);
      rightWindow->Show(TRUE);
      splitter->SplitHorizontally( leftWindow, rightWindow );
}

void MyFrame::OnUnsplit(wxCommandEvent& event)
{
      if ( splitter->IsSplit() )
          splitter->Unsplit();
}
```

wxTreeCtrl overview

Classes: *wxTreeCtrl* (p. 1140), *wxImageList* (p. 587)

The tree control displays its items in a tree like structure. Each item has its own (optional) icon and a label. An item may be either collapsed (meaning that its children are not visible) or expanded (meaning that its children are shown). Each item in the tree is identified by its *itemId* which is of opaque data type *wxTreeItemId*.

The items text and image may be retrieved and changed with *GetItemText* (p. 1147)/*SetItemText* (p. 1154) and *GetItemImage* (p. 1146)/*SetItemImage* (p. 1153). In fact, an item may even have two images associated with it: the normal one and another one for selected state which is set/retrieved with *SetItemSelectedImage* (p. 1153)/*GetItemSelectedImage* (p. 1149) functions, but this functionality might be unavailable on some platforms.

Tree items have several attributes: an item may be selected or not, visible or not, bold or not. It may also be expanded or collapsed. All these attributes may be retrieved with the corresponding functions: *IsSelected* (p. 1151), *IsVisible* (p. 1151), *IsBold* (p. 1150) and *IsExpanded* (p. 1151). Only one item at a time may be selected, selecting another one (with *SelectItem* (p. 1152)) automatically unselects the previously selected one.

In addition to its icon and label, a user-specific data structure may be associated with all tree items. If you wish to do it, you should derive a class from *wxTreeItemData* which is

a very simple class having only one function *GetId()* which returns the id of the item this data is associated with. This data will be freed by the control itself when the associated item is deleted (all items are deleted when the control is destroyed), so you shouldn't delete it yourself (if you do it, you should call *SetItemData(NULL)* (p. 1153) to prevent the tree from deleting the pointer second time). The associated data may be retrieved with *GetItemData()* (p. 1146) function.

Working with trees is relatively straightforward if all the items are added to the tree at the moment of its creation. However, for large trees it may be very inefficient. To improve the performance you may want to delay adding the items to the tree until the branch containing the items is expanded: so, in the beginning, only the root item is created (with *AddRoot* (p. 1142)). Other items are added when EVT_TREE_ITEM_EXPANDING event is received: then all items lying immediately under the item being expanded should be added, but, of course, only when this event is received for the first time for this item - otherwise, the items would be added twice if the user expands/collapses/re-expands the branch.

The tree control provides functions for enumerating its items. There are 3 groups of enumeration functions: for the children of a given item, for the sibling of the given item and for the visible items (those which are currently shown to the user: an item may be invisible either because its branch is collapsed or because it is scrolled out of view). Child enumeration functions require the caller to give them a *cookie* parameter: it is a number which is opaque to the caller but is used by the tree control itself to allow multiple enumerations to run simultaneously (this is explicitly allowed). The only thing to remember is that the *cookie* passed to *GetFirstChild* (p. 1145) and to *GetNextChild* (p. 1147) should be the same variable (and that nothing should be done with it by the user code).

Among other features of the tree control are: item sorting with *SortChildren* (p. 1154) which uses the user-defined comparison function *OnCompareItems* (p. 1151) (by default the comparison is the alphabetic comparison of tree labels), hit testing (determining to which portion of the control the given point belongs, useful for implementing drag-and-drop in the tree) with *HitTest* (p. 1150) and editing of the tree item labels in place (see *EditLabel* (p. 1144)).

Finally, the tree control has a keyboard interface: the cursor navigation (arrow) keys may be used to change the current selection. <HOME> and <END> are used to go to the first/last sibling of the current item. '+', '-' and '*' expand, collapse and toggle the current branch. Note, however, that <DEL> and <INS> keys do nothing by default, but it is usual to associate them with deleting item from a tree and inserting a new one into it.

wxListCtrl overview

Classes: *wxListCtrl* (p. 634), *wxImageList* (p. 587)

Sorry, this topic has yet to be written.

wxImageList overview

Classes: *wxImageList* (p. 587)

An image list is a list of images that may have transparent areas. The class helps an application organise a collection of images so that they can be referenced by integer index instead of by pointer.

Image lists are used in *wxNotebook* (p. 741), *wxListCtrl* (p. 634), *wxTreeCtrl* (p. 634) and some other control classes.

Common dialogs overview

Classes: *wxColourDialog* (p. 142), *wxFontDialog* (p. 447), *wxPrintDialog* (p. 802), *wxFileDialog* (p. 410), *wxDirDialog* (p. 327), *wxTextEntryDialog* (p. 1094), *wxMessageDialog* (p. 713), *wxSingleChoiceDialog* (p. 924), *wxMultipleChoiceDialog* (p. 734)

Common dialog classes and functions encapsulate commonly-needed dialog box requirements. They are all 'modal', grabbing the flow of control until the user dismisses the dialog, to make them easy to use within an application.

Some dialogs have both platform-dependent and platform-independent implementations, so that if underlying windowing systems that do not provide the required functionality, the generic classes and functions can stand in. For example, under MS Windows, wxColourDialog uses the standard colour selector. There is also an equivalent called wxGenericColourDialog for other platforms, and a macro defines wxColourDialog to be the same as wxGenericColourDialog on non-MS Windows platforms. However, under MS Windows, the generic dialog can also be used, for testing or other purposes.

wxColourDialog overview

Classes: *wxColourDialog* (p. 142), *wxColourData* (p. 139)

The wxColourDialog presents a colour selector to the user, and returns with colour information.

The MS Windows colour selector

Under Windows, the native colour selector common dialog is used. This presents a dialog box with three main regions: at the top left, a palette of 48 commonly-used colours is shown. Under this, there is a palette of 16 'custom colours' which can be set by the application if desired. Additionally, the user may open up the dialog box to show a right-hand panel containing controls to select a precise colour, and add it to the custom colour

palette.

The generic colour selector

Under non-MS Windows platforms, the colour selector is a simulation of most of the features of the MS Windows selector. Two palettes of 48 standard and 16 custom colours are presented, with the right-hand area containing three sliders for the user to select a colour from red, green and blue components. This colour may be added to the custom colour palette, and will replace either the currently selected custom colour, or the first one in the palette if none is selected. The RGB colour sliders are not optional in the generic colour selector. The generic colour selector is also available under MS Windows; use the name wxGenericColourDialog.

Example

In the samples/dialogs directory, there is an example of using the wxColourDialog class. Here is an excerpt, which sets various parameters of a wxColourData object, including a grey scale for the custom colours. If the user did not cancel the dialog, the application retrieves the selected colour and uses it to set the background of a window.

```
wxColourData data;
data.SetChooseFull(TRUE);
for (int i = 0; i < 16; i++)
{
  wxColour colour(i*16, i*16, i*16);
  data.SetCustomColour(i, colour);
}

wxColourDialog dialog(this, &data);
if (dialog.ShowModal() == wxID_OK)
{
  wxColourData retData = dialog.GetColourData();
  wxColour col = retData.GetColour();
  wxBrush brush(col, wxSOLID);
  myWindow->SetBackground(brush);
  myWindow->Clear();
  myWindow->Refresh();
}
```

wxFontDialog overview

Classes: *wxFontDialog* (p. 447), *wxFontData* (p. 444)

The wxFontDialog presents a font selector to the user, and returns with font and colour information.

The MS Windows font selector

Under Windows, the native font selector common dialog is used. This presents a dialog box with controls for font name, point size, style, weight, underlining, strikeout and text foreground colour. A sample of the font is shown on a white area of the dialog box. Note

that in the translation from full MS Windows fonts to wxWindows font conventions, strikeout is ignored and a font family (such as Swiss or Modern) is deduced from the actual font name (such as Arial or Courier). The full range of Windows fonts cannot be used in wxWindows at present.

The generic font selector

Under non-MS Windows platforms, the font selector is simpler. Controls for font family, point size, style, weight, underlining and text foreground colour are provided, and a sample is shown upon a white background. The generic font selector is also available under MS Windows; use the name wxGenericFontDialog.

In both cases, the application is responsible for deleting the new font returned from calling wxFontDialog::Show (if any). This returned font is guaranteed to be a new object and not one currently in use in the application.

Example

In the samples/dialogs directory, there is an example of using the wxFontDialog class. The application uses the returned font and colour for drawing text on a canvas. Here is an excerpt:

```
wxFontData data;
data.SetInitialFont(canvasFont);
data.SetColour(canvasTextColour);

wxFontDialog dialog(this, &data);
if (dialog.ShowModal() == wxID_OK)
{
  wxFontData retData = dialog.GetFontData();
  canvasFont = retData.GetChosenFont();
  canvasTextColour = retData.GetColour();
  myWindow->Refresh();
}
```

wxPrintDialog overview

Classes: *wxPrintDialog* (p. 802), *wxPrintData* (p. 796)

This class represents the print and print setup common dialogs. You may obtain a *wxPrinterDC* (p. 810) device context from a successfully dismissed print dialog.

The samples/printing example shows how to use it: see *Printing overview* (p. 1428) for an excerpt from this example.

wxFileDialog overview

Classes: *wxFileDialog* (p. 410)

Pops up a file selector box. In Windows, this is the common file selector dialog. In X, this

is a file selector box with somewhat less functionality. The path and filename are distinct elements of a full file pathname. If path is "", the current directory will be used. If filename is "", no default filename will be supplied. The wildcard determines what files are displayed in the file selector, and file extension supplies a type extension for the required filename. Flags may be a combination of wxOPEN, wxSAVE, wxOVERWRITE_PROMPT, wxHIDE_READONLY, wxFILE_MUST_EXIST or 0.

Both the X and Windows versions implement a wildcard filter. Typing a filename containing wildcards (*, ?) in the filename text item, and clicking on Ok, will result in only those files matching the pattern being displayed. In the X version, supplying no default name will result in the wildcard filter being inserted in the filename text item; the filter is ignored if a default name is supplied.

The wildcard may be a specification for multiple types of file with a description for each, such as:

```
"BMP files (*.bmp) | *.bmp | GIF files (*.gif) | *.gif"
```

wxDirDialog overview

Classes: *wxDirDialog* (p. 327)

This dialog shows a directory selector dialog, allowing the user to select a single directory.

wxTextEntryDialog overview

Classes: *wxTextEntryDialog* (p. 1094)

This is a dialog with a text entry field. The value that the user entered is obtained using *wxTextEntryDialog::GetValue* (p. 1095).

wxMessageDialog overview

Classes: *wxMessageDialog* (p. 713)

This dialog shows a message, plus buttons that can be chosen from OK, Cancel, Yes, and No. Under Windows, an optional icon can be shown, such as an exclamation mark or question mark.

The return value of *wxMessageDialog::ShowModal* (p. 714) indicates which button the user pressed.

wxSingleChoiceDialog overview

Classes: *wxSingleChoiceDialog* (p. 924)

This dialog shows a list of choices, plus OK and (optionally) Cancel. The user can select one of them. The selection can be obtained from the dialog as an index, a string or client data.

wxMultipleChoiceDialog overview

Classes: *wxMultipleChoiceDialog* (p. 734)

This dialog shows a list of choices, plus OK and (optionally) Cancel. The user can select one or more of them.

Document/view overview

Classes: *wxDocument* (p. 353), *wxView* (p. 1184), *wxDocTemplate* (p. 348), *wxDocManager* (p. 334), *wxDocParentFrame* (p. 346), *wxDocChildFrame* (p. 332), *wxDocMDIParentFrame* (p. 345), *wxDocMDIChildFrame* (p. 343), *wxCommand* (p. 151), *wxCommandProcessor* (p. 158)

The document/view framework is found in most application frameworks, because it can dramatically simplify the code required to build many kinds of application.

The idea is that you can model your application primarily in terms of *documents* to store data and provide interface-independent operations upon it, and *views* to visualise and manipulate the data. Documents know how to do input and output given stream objects, and views are responsible for taking input from physical windows and performing the manipulation on the document data. If a document's data changes, all views should be updated to reflect the change.

The framework can provide many user-interface elements based on this model. Once you have defined your own classes and the relationships between them, the framework takes care of popping up file selectors, opening and closing files, asking the user to save modifications, routing menu commands to appropriate (possibly default) code, even some default print/preview functionality and support for command undo/redo. The framework is highly modular, allowing overriding and replacement of functionality and objects to achieve more than the default behaviour.

These are the overall steps involved in creating an application based on the document/view framework:

1. Define your own document and view classes, overriding a minimal set of member functions e.g. for input/output, drawing and initialization.
2. Define any subwindows (such as a scrolled window) that are needed for the view(s). You may need to route some events to views or documents, for example OnPaint needs to be routed to wxView::OnDraw.
3. Decide what style of interface you will use: Microsoft's MDI (multiple document

child frames surrounded by an overall frame), SDI (a separate, unconstrained frame for each document), or single-window (one document open at a time, as in Windows Write).

4. Use the appropriate wxDocParentFrame and wxDocChildFrame classes. Construct an instance of wxDocParentFrame in your wxApp::OnInit, and a wxDocChildFrame (if not single-window) when you initialize a view. Create menus using standard menu ids (such as wxID_OPEN, wxID_PRINT), routing non-application-specific identifiers to the base frame's OnMenuCommand.

5. Construct a single wxDocManager instance at the beginning of your wxApp::OnInit, and then as many wxDocTemplate instances as necessary to define relationships between documents and views. For a simple application, there will be just one wxDocTemplate.

If you wish to implement Undo/Redo, you need to derive your own class(es) from wxCommand and use wxCommandProcessor::Submit instead of directly executing code. The framework will take care of calling Undo and Do functions as appropriate, so long as the wxID_UNDO and wxID_REDO menu items are defined in the view menu.

Here are a few examples of the tailoring you can do to go beyond the default framework behaviour:

- Override wxDocument::OnCreateCommandProcessor to define a different Do/Undo strategy, or a command history editor.
- Override wxView::OnCreatePrintout to create an instance of a derived *wxPrintout* (p. 811) class, to provide multi-page document facilities.
- Override wxDocManager::SelectDocumentPath to provide a different file selector.
- Limit the maximum number of open documents and the maximum number of undo commands.

Note that to activate framework functionality, you need to use some or all of the wxWindows *predefined command identifiers* (p. 1416) in your menus.

wxDocument overview

Document/view framework overview (p. 1411)

Class: *wxDocument* (p. 353)

The wxDocument class can be used to model an application's file-based data. It is part of the document/view framework supported by wxWindows, and cooperates with the *wxView* (p. 1184), *wxDocTemplate* (p. 348) and *wxDocManager* (p. 334) classes.

Using this framework can save a lot of routine user-interface programming, since a range of menu commands -- such as open, save, save as -- are supported automatically. The programmer just needs to define a minimal set of classes and member functions for the framework to call when necessary. Data, and the means to view and edit the data, are explicitly separated out in this model, and the concept of multiple *views* onto the same data is supported.

Note that the document/view model will suit many but not all styles of application. For example, it would be overkill for a simple file conversion utility, where there may be no call for *views* on *documents* or the ability to open, edit and save files. But probably the majority of applications are document-based.

See the example application in `samples/docview`.

To use the abstract wxDocument class, you need to derive a new class and override at least the member functions SaveObject and LoadObject. SaveObject and LoadObject will be called by the framework when the document needs to be saved or loaded.

Use the macros DECLARE_DYNAMIC_CLASS and IMPLEMENT_DYNAMIC_CLASS in order to allow the framework to create document objects on demand. When you create a *wxDocTemplate* (p. 348) object on application initialization, you should pass CLASSINFO(YourDocumentClass) to the wxDocTemplate constructor so that it knows how to create an instance of this class.

If you do not wish to use the wxWindows method of creating document objects dynamically, you must override wxDocTemplate::CreateDocument to return an instance of the appropriate class.

wxView overview

Document/view framework overview (p. 1411)

Class: *wxView* (p. 1184)

The wxView class can be used to model the viewing and editing component of an application's file-based data. It is part of the document/view framework supported by wxWindows, and cooperates with the *wxDocument* (p. 353), *wxDocTemplate* (p. 348) and *wxDocManager* (p. 334) classes.

See the example application in `samples/docview`.

To use the abstract wxView class, you need to derive a new class and override at least the member functions OnCreate, OnDraw, OnUpdate and OnClose. You will probably want to override OnMenuCommand to respond to menu commands from the frame containing the view.

Use the macros DECLARE_DYNAMIC_CLASS and IMPLEMENT_DYNAMIC_CLASS in order to allow the framework to create view objects on demand. When you create a *wxDocTemplate* (p. 348) object on application initialization, you should pass CLASSINFO(YourViewClass) to the wxDocTemplate constructor so that it knows how to create an instance of this class.

If you do not wish to use the wxWindows method of creating view objects dynamically, you must override wxDocTemplate::CreateView to return an instance of the appropriate class.

wxDocTemplate overview

Document/view framework overview (p. 1411)

Class: *wxDocTemplate* (p. 348)

The wxDocTemplate class is used to model the relationship between a document class and a view class. The application creates a document template object for each document/view pair. The list of document templates managed by the wxDocManager instance is used to create documents and views. Each document template knows what file filters and default extension are appropriate for a document/view combination, and how to create a document or view.

For example, you might write a small doodling application that can load and save lists of line segments. If you had two views of the data -- graphical, and a list of the segments -- then you would create one document class DoodleDocument, and two view classes (DoodleGraphicView and DoodleListView). You would also need two document templates, one for the graphical view and another for the list view. You would pass the same document class and default file extension to both document templates, but each would be passed a different view class. When the user clicks on the Open menu item, the file selector is displayed with a list of possible file filters -- one for each wxDocTemplate. Selecting the filter selects the wxDocTemplate, and when a file is selected, that template will be used for creating a document and view. Under non-Windows platforms, the user will be prompted for a list of templates before the file selector is shown, since most file selectors do not allow a choice of file filters.

For the case where an application has one document type and one view type, a single document template is constructed, and dialogs will be appropriately simplified.

wxDocTemplate is part of the document/view framework supported by wxWindows, and cooperates with the *wxView* (p. 1184), *wxDocument* (p. 353) and *wxDocManager* (p. 334) classes.

See the example application in `samples/docview`.

To use the wxDocTemplate class, you do not need to derive a new class. Just pass relevant information to the constructor including CLASSINFO(YourDocumentClass) and CLASSINFO(YourViewClass) to allow dynamic instance creation. If you do not wish to use the wxWindows method of creating document objects dynamically, you must override wxDocTemplate::CreateDocument and wxDocTemplate::CreateView to return instances of the appropriate class.

NOTE: the document template has nothing to do with the C++ template construct. C++ templates are not used anywhere in wxWindows.

wxDocManager overview

Document/view framework overview (p. 1411)

Class: *wxDocManager* (p. 334)

The wxDocManager class is part of the document/view framework supported by wxWindows, and cooperates with the *wxView* (p. 1184), *wxDocument* (p. 353) and *wxDocTemplate* (p. 348) classes.

A wxDocManager instance coordinates documents, views and document templates. It keeps a list of document and template instances, and much functionality is routed through this object, such as providing selection and file dialogs. The application can use this class 'as is' or derive a class and override some members to extend or change the functionality. Create an instance of this class near the beginning of your application initialization, before any documents, views or templates are manipulated.

There may be multiple wxDocManager instances in an application.

See the example application in `samples/docview`.

wxCommand overview

Document/view framework overview (p. 1411)

Classes: *wxCommand* (p. 151), *wxCommandProcessor* (p. 158)

wxCommand is a base class for modelling an application command, which is an action usually performed by selecting a menu item, pressing a toolbar button or any other means provided by the application to change the data or view.

Instead of the application functionality being scattered around switch statements and functions in a way that may be hard to read and maintain, the functionality for a command is explicitly represented as an object which can be manipulated by a framework or application. When a user interface event occurs, the application *submits* a command to a *wxCommandProcessor* (p. 1415) object to execute and store.

The wxWindows document/view framework handles Undo and Redo by use of wxCommand and wxCommandProcessor objects. You might find further uses for wxCommand, such as implementing a macro facility that stores, loads and replays commands.

An application can derive a new class for every command, or, more likely, use one class parameterized with an integer or string command identifier.

wxCommandProcessor overview

Document/view framework overview (p. 1411)

Classes: *wxCommandProcessor* (p. 158), *wxCommand* (p. 151)

wxCommandProcessor is a class that maintains a history of wxCommand instances, with undo/redo functionality built-in. Derive a new class from this if you want different behaviour.

wxFileHistory overview

Document/view framework overview (p. 1411)

Classes: *wxFileHistory* (p. 415), *wxDocManager* (p. 334)

wxFileHistory encapsulates functionality to record the last few files visited, and to allow the user to quickly load these files using the list appended to the File menu.

Although wxFileHistory is used by wxDocManager, it can be used independently. You may wish to derive from it to allow different behaviour, such as popping up a scrolling list of files.

By calling wxFileHistory::FileHistoryUseMenu you can associate a file menu with the file history, that will be used for appending the filenames. They are appended using menu identifiers in the range wxID_FILE1 to wxID_FILE9.

In order to respond to a file load command from one of these identifiers, you need to handle them using an event handler, for example:

```
BEGIN_EVENT_TABLE(wxDocParentFrame, wxFrame)
    EVT_MENU(wxID_EXIT, wxDocParentFrame::OnExit)
    EVT_MENU_RANGE(wxID_FILE1, wxID_FILE9, wxDocParentFrame::OnMRUFile)
END_EVENT_TABLE()

void wxDocParentFrame::OnExit(wxCommandEvent& WXUNUSED(event))
{
    Close();
}

void wxDocParentFrame::OnMRUFile(wxCommandEvent& event)
{
      wxString f(m_docManager->GetHistoryFile(event.GetSelection() -
wxID_FILE1));
      if (f != "")
        (void)m_docManager->CreateDocument(f, wxDOC_SILENT);
}
```

wxWindows predefined command identifiers

To allow communication between the application's menus and the document/view framework, several command identifiers are predefined for you to use in menus. The

framework recognizes them and processes them if you forward commands from wxFrame::OnMenuCommand (or perhaps from toolbars and other user interface constructs).

- wxID_OPEN (5000)
- wxID_CLOSE (5001)
- wxID_NEW (5002)
- wxID_SAVE (5003)
- wxID_SAVEAS (5004)
- wxID_REVERT (5005)
- wxID_EXIT (5006)
- wxID_UNDO (5007)
- wxID_REDO (5008)
- wxID_HELP (5009)
- wxID_PRINT (5010)
- wxID_PRINT_SETUP (5011)
- wxID_PREVIEW (5012)

wxTab classes overview

Classes: *wxTabView* (p. 1049), *wxPanelTabView* (p. 772), *wxTabbedPanel* (p. 1045), *wxTabbedDialog* (p. 1044), *wxTabControl* (p. 1046)

The tab classes provides a way to display rows of tabs (like file divider tabs), which can be used to switch between panels or other information. Tabs are most commonly used in dialog boxes where the number of options is too great to fit on one dialog.

Please note that the preferred class for programming tabbed windows is *wxNotebook* (p. 741). The old tab classes are retained for backward compatibility and also to implement wxNotebook on platforms that don't have native tab controls.

The appearance and behaviour of a wxTabbedDialog

The following screenshot shows the appearance of the sample tabbed dialog application.
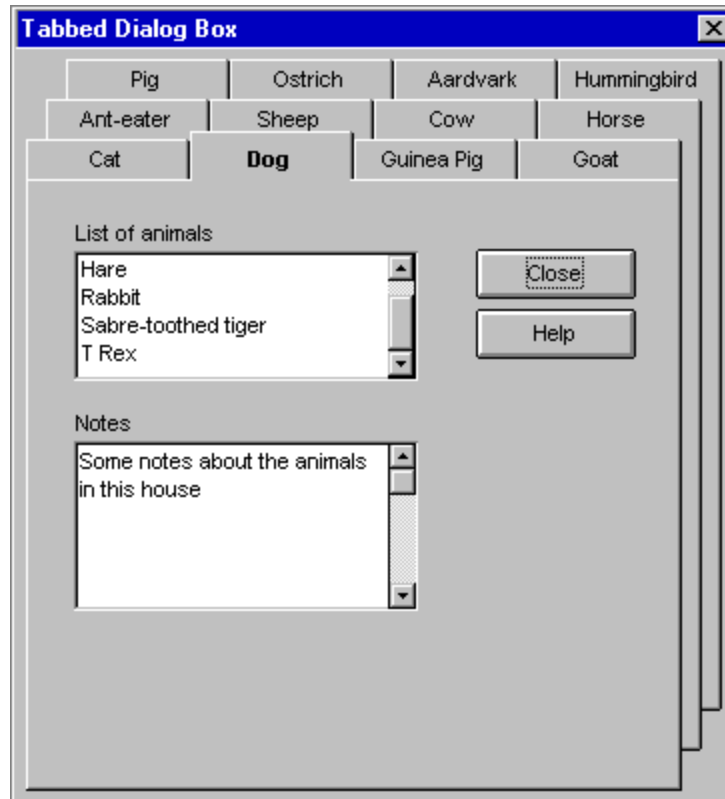
By clicking on the tabs, the user can display a different set of controls. In the example, the Close and Help buttons remain constant. These two buttons are children of the main dialog box, whereas the other controls are children of panels which are shown and hidden according to which tab is active.

A tabbed dialog may have several layers (rows) of tabs, each being offset vertically and horizontally from the previous. Tabs work in columns, in that when a tab is pressed, it swaps place with the tab on the first row of the same column, in order to give the effect of displaying that tab. All tabs must be of the same width. This is a constraint of the implementation, but it also means that the user will find it easier to find tabs since there are distinct tab columns. On some tabbed dialog implementations, tabs jump around seemingly randomly because tabs have different widths. In this implementation, a tab can always be found on the same column.

Tabs are always drawn along the top of the view area; the implementation does not allow for vertical tabs or any other configuration.

Using tabs

The tab classes provide facilities for switching between contexts by means of 'tabs', which look like file divider tabs.

You must create both a *view* to handle the tabs, and a *window* to display the tabs and related information. The wxTabbedDialog and wxTabbedPanel classes are provided for convenience, but you could equally well construct your own window class and derived tab view.

If you wish to display a tabbed dialog - the most common use - you should follow these steps.

1. Create a new wxTabbedDialog class, and any buttons you wish always to be displayed (regardless of which tab is active).
2. Create a new wxPanelTabView, passing the dialog as the first argument.
3. Set the view rectangle with *wxTabView::SetViewRect* (p. 1057), to specify the area in which child panels will be shown. The tabs will sit on top of this view rectangle.
4. Call *wxTabView::CalculateTabWidth* (p. 1050) to calculate the width of the tabs based on the view area. This is optional if, for example, you have one row of tabs which does not extend the full width of the view area.
5. Call *wxTabView::AddTab* (p. 1050) for each of the tabs you wish to create, passing a unique identifier and a tab label.
6. Construct a number of windows, one for each tab, and call *wxPanelTabView::AddTabWindow* (p. 773) for each of these, passing a tab identifier and the window.
7. Set the tab selection.
8. Show the dialog.

Under Motif, you may also need to size the dialog just before setting the tab selection, for unknown reasons.

Some constraints you need to be aware of:

- All tabs must be of the same width.
- Omit the wxTAB_STYLE_COLOUR_INTERIOR flag to ensure that the dialog background and tab backgrounds match.

Example

The following fragment is taken from the file test.cpp.

```
void MyDialog::Init(void)
{
  int dialogWidth = 365;
  int dialogHeight = 390;

  wxButton *okButton = new wxButton(this, wxID_OK, "Close",
wxPoint(100, 330), wxSize(80, 25));
  wxButton *cancelButton = new wxButton(this, wxID_CANCEL, "Cancel",
wxPoint(185, 330), wxSize(80, 25));
  wxButton *HelpButton = new wxButton(this, wxID_HELP, "Help",
wxPoint(270, 330), wxSize(80, 25));
  okButton->SetDefault();

  // Note, omit the wxTAB_STYLE_COLOUR_INTERIOR, so we will guarantee a
match
  // with the panel background, and save a bit of time.
```

```
  wxPanelTabView *view = new wxPanelTabView(this,
wxTAB_STYLE_DRAW_BOX);

  wxRectangle rect;
  rect.x = 5;
  rect.y = 70;
  // Could calculate the view width from the tab width and spacing,
  // as below, but let's assume we have a fixed view width.
//  rect.width = view->GetTabWidth()*4 + 3*view-
>GetHorizontalTabSpacing();
  rect.width = 326;
  rect.height = 250;

  view->SetViewRect(rect);

  // Calculate the tab width for 4 tabs, based on a view width of 326
and
  // the current horizontal spacing. Adjust the view width to exactly
fit
  // the tabs.
  view->CalculateTabWidth(4, TRUE);

  if (!view->AddTab(TEST_TAB_CAT,        wxString("Cat")))
    return;

  if (!view->AddTab(TEST_TAB_DOG,        wxString("Dog")))
    return;
  if (!view->AddTab(TEST_TAB_GUINEAPIG,  wxString("Guinea Pig")))
    return;
  if (!view->AddTab(TEST_TAB_GOAT,       wxString("Goat")))
    return;
  if (!view->AddTab(TEST_TAB_ANTEATER,   wxString("Ant-eater")))
    return;
  if (!view->AddTab(TEST_TAB_SHEEP,      wxString("Sheep")))
    return;
  if (!view->AddTab(TEST_TAB_COW,        wxString("Cow")))
    return;
  if (!view->AddTab(TEST_TAB_HORSE,      wxString("Horse")))
    return;
  if (!view->AddTab(TEST_TAB_PIG,        wxString("Pig")))
    return;
  if (!view->AddTab(TEST_TAB_OSTRICH,    wxString("Ostrich")))
    return;
  if (!view->AddTab(TEST_TAB_AARDVARK,   wxString("Aardvark")))
    return;
  if (!view->AddTab(TEST_TAB_HUMMINGBIRD,wxString("Hummingbird")))
    return;

  // Add some panels
  wxPanel *panel1 = new wxPanel(this, -1, wxPoint(rect.x + 20, rect.y +
10), wxSize(290, 220), wxTAB_TRAVERSAL);
  (void)new wxButton(panel1, -1, "Press me", wxPoint(10, 10));
  (void)new wxTextCtrl(panel1, -1, "1234", wxPoint(10, 40), wxSize(120,
150));

  view->AddTabWindow(TEST_TAB_CAT, panel1);
```

```
  wxPanel *panel2 = new wxPanel(this, -1, wxPoint(rect.x + 20, rect.y +
10), wxSize(290, 220));

  wxString animals[] = { "Fox", "Hare", "Rabbit", "Sabre-toothed
tiger", "T Rex" };
  (void)new wxListBox(panel2, -1, wxPoint(5, 5), wxSize(170, 80), 5,
animals);

  (void)new wxTextCtrl(panel2, -1, "Some notes about the animals in
this house", wxPoint(5, 100), wxSize(170, 100)),
    wxTE_MULTILINE;

  view->AddTabWindow(TEST_TAB_DOG, panel2);

  // Don't know why this is necessary under Motif...
#ifdef wx_motif
  this->SetSize(dialogWidth, dialogHeight-20);
#endif

  view->SetTabSelection(TEST_TAB_CAT);

  this->Centre(wxBOTH);
}
```

wxTabView overview

Classes: *wxTabView* (p. 1049), *wxPanelTabView* (p. 772)

A wxTabView manages and draws a number of tabs. Because it is separate from the tabbed window implementation, it can be reused in a number of contexts. This library provides tabbed dialog and panel classes to use with the wxPanelTabView class, but an application could derive other kinds of view from wxTabView.

For example, a help application might draw a representation of a book on a window, with a row of tabs along the top. The new tab view class might be called wxCanvasTabView, for example, with the wxBookCanvas posting the OnEvent function to the wxCanvasTabView before processing further, application-specific event processing.

A window class designed to work with a view class must call the view's OnEvent and Draw functions at appropriate times.

Toolbar overview

Classes: *wxToolBar* (p. 1123)

The toolbar family of classes allows an application to use toolbars in a variety of configurations and styles.

The toolbar is a popular user interface component and contains a set of bitmap buttons or toggles. A toolbar gives faster access to an application's facilities than menus, which have to be popped up and selected rather laboriously.

Instead of supplying one toolbar class with a number of different implementations depending on platform, wxWindows separates out the classes. This is because there are a number of different toolbar styles that you may wish to use simultaneously, and also, future toolbar implementations will emerge which cannot all be shoe-horned into the one class.

For each platform, the symbol **wxToolBar** is defined to be one of the specific toolbar classes.

The following is a summary of the toolbar classes and their differences.

- **wxToolBarBase.** This is a base class with pure virtual functions, and should not be used directly.
- **wxToolBarSimple.** A simple toolbar class written entirely with generic wxWindows functionality. A simple 3D effect for buttons is possible, but it is not consistent with the Windows look and feel. This toolbar can scroll, and you can have arbitrary numbers of rows and columns.
- **wxToolBarMSW.** This class implements an old-style Windows toolbar, only on Windows. There are small, three-dimensional buttons, which do not (currently) reflect the current Windows colour settings: the buttons are grey. This is the default wxToolBar on 16-bit windows.
- **wxToolBar95.** Uses the native Windows 95 toolbar class. It dynamically adjusts its background and button colours according to user colour settings. CreateTools must be called after the tools have been added. No absolute positioning is supported but you can specify the number of rows, and add tool separators with **AddSeparator**. Tooltips are supported. **OnRightClick** is not supported. This is the default wxToolBar on Windows 95, Windows NT 4 and above. With the style wxTB_FLAT, the flat toolbar look is used, with a border that is highlighted when the cursor moves over the buttons.

A toolbar might appear as a single row of images under the menubar, or it might be in a separate frame layout in several rows and columns. The class handles the layout of the images, unless explicit positioning is requested.

A tool is a bitmap which can either be a button (there is no 'state', it just generates an event when clicked) or it can be a toggle. If a toggle, a second bitmap can be provided to depict the 'on' state; if the second bitmap is omitted, either the inverse of the first bitmap will be used (for monochrome displays) or a thick border is drawn around the bitmap (for colour displays where inverting will not have the desired result).

The Windows-specific toolbar classes expect 16-colour bitmaps that are 16 pixels wide and 15 pixels high. If you want to use a different size, call **SetToolBitmapSize** as the

demo shows, before adding tools to the button bar. Don't supply more than one bitmap for each tool, because the toolbar generates all three images (normal, depressed and checked) from the single bitmap you give it.

Using the toolbar library

Include `"wx/toolbar.h"`, or if using a class directly, one of:

- `"wx/msw/tbarmsw.h` for wxToolBarMSW
- `"wx/msw/tbar95.h` for wxToolBar95
- `"wx/tbarsmpl.h` for wxToolBarSimple

Example of toolbar use are given in the sample program "toolbar". The source is given below. In fact it is out of date because recommended practise is to use event handlers (using EVT_MENU or EVT_TOOL) instead of overriding OnLeftClick.

```
/////////////////////////////////////////////////////////////////////
//////
// Name:        test.cpp
// Purpose:     wxToolBar sample
// Author:      Julian Smart
// Modified by:
// Created:     04/01/98
// RCS-ID:      $Id: ttoolbar.tex,v 1.6.2.2 2000/04/27 14:32:59 VS Exp
$
// Copyright:   (c) Julian Smart
// License:       wxWindows license
/////////////////////////////////////////////////////////////////////
//////

// For compilers that support precompilation, includes "wx/wx.h".
#include "wx/wxprec.h"

#ifdef __BORLANDC__
#pragma hdrstop
#endif

#ifndef WX_PRECOMP
#include "wx/wx.h"
#endif

#include "wx/toolbar.h"
#include <wx/log.h>

#include "test.h"

#if defined(__WXGTK__) || defined(__WXMOTIF__)
#include "mondrian.xpm"
#include "bitmaps/new.xpm"
#include "bitmaps/open.xpm"
#include "bitmaps/save.xpm"
#include "bitmaps/copy.xpm"
```

```
#include "bitmaps/cut.xpm"
#include "bitmaps/print.xpm"
#include "bitmaps/preview.xpm"
#include "bitmaps/help.xpm"
#endif

IMPLEMENT_APP(MyApp)

// The `main program' equivalent, creating the windows and returning
the
// main frame
bool MyApp::OnInit(void)
{
  // Create the main frame window
  MyFrame* frame = new MyFrame((wxFrame *) NULL, -1, (const wxString)
"wxToolBar Sample",
      wxPoint(100, 100), wxSize(450, 300));

  // Give it a status line
  frame->CreateStatusBar();

  // Give it an icon
  frame->SetIcon(wxICON(mondrian));

  // Make a menubar
  wxMenu *fileMenu = new wxMenu;
  fileMenu->Append(wxID_EXIT, "E&xit", "Quit toolbar sample" );

  wxMenu *helpMenu = new wxMenu;
  helpMenu->Append(wxID_HELP, "&About", "About toolbar sample");

  wxMenuBar* menuBar = new wxMenuBar;

  menuBar->Append(fileMenu, "&File");
  menuBar->Append(helpMenu, "&Help");

  // Associate the menu bar with the frame
  frame->SetMenuBar(menuBar);

  // Create the toolbar
  frame->CreateToolBar(wxNO_BORDER|wxHORIZONTAL|wxTB_FLAT, ID_TOOLBAR);

  frame->GetToolBar()->SetMargins( 2, 2 );

  InitToolbar(frame->GetToolBar());

  // Force a resize. This should probably be replaced by a call to a
wxFrame
  // function that lays out default decorations and the remaining
content window.
  wxSizeEvent event(wxSize(-1, -1), frame->GetId());
  frame->OnSize(event);
  frame->Show(TRUE);

  frame->SetStatusText("Hello, wxWindows");

  SetTopWindow(frame);
```

```
  return TRUE;
}

bool MyApp::InitToolbar(wxToolBar* toolBar)
{
  // Set up toolbar
  wxBitmap* toolBarBitmaps[8];

#ifdef __WXMSW__
  toolBarBitmaps[0] = new wxBitmap("icon1");
  toolBarBitmaps[1] = new wxBitmap("icon2");
  toolBarBitmaps[2] = new wxBitmap("icon3");
  toolBarBitmaps[3] = new wxBitmap("icon4");
  toolBarBitmaps[4] = new wxBitmap("icon5");
  toolBarBitmaps[5] = new wxBitmap("icon6");
  toolBarBitmaps[6] = new wxBitmap("icon7");
  toolBarBitmaps[7] = new wxBitmap("icon8");
#else
  toolBarBitmaps[0] = new wxBitmap( new_xpm );
  toolBarBitmaps[1] = new wxBitmap( open_xpm );
  toolBarBitmaps[2] = new wxBitmap( save_xpm );
  toolBarBitmaps[3] = new wxBitmap( copy_xpm );
  toolBarBitmaps[4] = new wxBitmap( cut_xpm );
  toolBarBitmaps[5] = new wxBitmap( preview_xpm );
  toolBarBitmaps[6] = new wxBitmap( print_xpm );
  toolBarBitmaps[7] = new wxBitmap( help_xpm );
#endif

#ifdef __WXMSW__
  int width = 24;
#else
  int width = 16;
#endif
  int currentX = 5;

  toolBar->AddTool(wxID_NEW, *(toolBarBitmaps[0]), wxNullBitmap, FALSE,
currentX, -1, (wxObject *) NULL, "New file");
  currentX += width + 5;
  toolBar->AddTool(wxID_OPEN, *(toolBarBitmaps[1]), wxNullBitmap,
FALSE, currentX, -1, (wxObject *) NULL, "Open file");
  currentX += width + 5;
  toolBar->AddTool(wxID_SAVE, *(toolBarBitmaps[2]), wxNullBitmap,
FALSE, currentX, -1, (wxObject *) NULL, "Save file");
  currentX += width + 5;
  toolBar->AddSeparator();
  toolBar->AddTool(wxID_COPY, *(toolBarBitmaps[3]), wxNullBitmap,
FALSE, currentX, -1, (wxObject *) NULL, "Copy");
  currentX += width + 5;
  toolBar->AddTool(wxID_CUT, *(toolBarBitmaps[4]), wxNullBitmap, FALSE,
currentX, -1, (wxObject *) NULL, "Cut");
  currentX += width + 5;
  toolBar->AddTool(wxID_PASTE, *(toolBarBitmaps[5]), wxNullBitmap,
FALSE, currentX, -1, (wxObject *) NULL, "Paste");
  currentX += width + 5;
  toolBar->AddSeparator();
  toolBar->AddTool(wxID_PRINT, *(toolBarBitmaps[6]), wxNullBitmap,
```

```
FALSE, currentX, -1, (wxObject *) NULL, "Print");
  currentX += width + 5;
  toolBar->AddSeparator();
  toolBar->AddTool(wxID_HELP, *(toolBarBitmaps[7]), wxNullBitmap,
FALSE, currentX, -1, (wxObject *) NULL, "Help");

  toolBar->Realize();

  // Can delete the bitmaps since they're reference counted
  int i;
  for (i = 0; i < 8; i++)
    delete toolBarBitmaps[i];

  return TRUE;
}

// wxID_HELP will be processed for the 'About' menu and the toolbar
help button.

BEGIN_EVENT_TABLE(MyFrame, wxFrame)
    EVT_MENU(wxID_EXIT, MyFrame::OnQuit)
    EVT_MENU(wxID_HELP, MyFrame::OnAbout)
    EVT_CLOSE(MyFrame::OnCloseWindow)
    EVT_TOOL_RANGE(wxID_OPEN, wxID_PASTE, MyFrame::OnToolLeftClick)
    EVT_TOOL_ENTER(wxID_OPEN, MyFrame::OnToolEnter)
END_EVENT_TABLE()

// Define my frame constructor
MyFrame::MyFrame(wxFrame* parent, wxWindowID id, const wxString& title,
const wxPoint& pos,
        const wxSize& size, long style):
  wxFrame(parent, id, title, pos, size, style)
{
  m_textWindow = new wxTextCtrl(this, -1, "", wxPoint(0, 0), wxSize(-1,
-1), wxTE_MULTILINE);
}

void MyFrame::OnQuit(wxCommandEvent& WXUNUSED(event))
{
    Close(TRUE);
}

void MyFrame::OnAbout(wxCommandEvent& WXUNUSED(event))
{
    (void)wxMessageBox("wxWindows toolbar sample", "About wxToolBar");
}

// Define the behaviour for the frame closing
// - must delete all frames except for the main one.
void MyFrame::OnCloseWindow(wxCloseEvent& WXUNUSED(event))
{
  Destroy();
}

void MyFrame::OnToolLeftClick(wxCommandEvent& event)
{
  wxString str;
```

```
    str.Printf("Clicked on tool %d", event.GetId());
    SetStatusText(str);
}

void MyFrame::OnToolEnter(wxCommandEvent& event)
{
  if (event.GetSelection() > -1)
  {
    wxString str;
    str.Printf("This is tool number %d", event.GetSelection());
    SetStatusText(str);
  }
  else
    SetStatusText("");
}
```

wxGrid classes overview

wxGrid is a class for displaying and editing tabular information.

To use wxGrid, include the wxgrid.h header file and link with the wxGrid library. Create a wxGrid object, or, if you need to override some default behaviour, create an object of a class derived from wxGrid. You need to call CreateGrid before there are any cells in the grid.

All row and column positions start from zero, and dimensions are in pixels.

If you make changes to row or column dimensions, call UpdateDimensions and then AdjustScrollbars. If you make changes to the grid appearance (such as a change of cell background colour or font), call Refresh for the changes to be shown.

Example

The following fragment is taken from the file samples/grid/test.cpp. Note the call to UpdateDimensions, which is required if the application has changed any dimensions such as column width or row height. You may also need to call AdjustScrollbars. In this case, AdjustScrollbars isn't necessary because it will be called by wxGrid::OnSize which is invoked when the window is first displayed.

```
// Make a grid
frame->grid = new wxGrid(frame, 0, 0, 400, 400);

frame->grid->CreateGrid(10, 8);
frame->grid->SetColumnWidth(3, 200);
frame->grid->SetRowHeight(4, 45);
frame->grid->SetCellValue("First cell", 0, 0);
frame->grid->SetCellValue("Another cell", 1, 1);
```

```
  frame->grid->SetCellValue("Yet another cell", 2, 2);
  frame->grid->SetCellTextFont(wxTheFontList->FindOrCreateFont(12,
wxROMAN, wxITALIC, wxNORMAL), 0, 0);
  frame->grid->SetCellTextColour(*wxRED, 1, 1);
  frame->grid->SetCellBackgroundColour(*wxCYAN, 2, 2);
  frame->grid->UpdateDimensions();
```

wxTipProvider overview

Many "modern" Windows programs have a feature (some would say annoyance) of presenting the user tips at program startup. While this is probably useless to the advanced users of the program, the experience shows that the tips may be quite helpful for the novices and so more and more programs now do this.

For a wxWindows programmer, implementing this feature is extremely easy. To show a tip, it is enough to just call *wxShowTip* (p. 1268) function like this:

```
    if ( ...show tips at startup?... )
    {
        wxTipProvider *tipProvider =
wxCreateFileTipProvider("tips.txt", 0);
        wxShowTip(windowParent, tipProvider);
        delete tipProvider;
    }
```

Of course, you need to get the text of the tips from somewhere - in the example above, the text is supposed to be in the file tips.txt from where it is read by the *tip provider*. The tip provider is just an object of a class deriving from *wxTipProvider* (p. 1122). It has to implement one pure virtual function of the base class: *GetTip* (p. 1122). In the case of the tip provider created by *wxCreateFileTipProvider* (p. 1262), the tips are just the lines of the text file.

If you want to implement your own tip provider (for example, if you wish to hardcode the tips inside your program), you just have to derive another class from wxTipProvider and pass a pointer to the object of this class to wxShowTip - then you don't need wxCreateFileTipProvider at all.

Finally, you will probably want to save somewhere the index of the tip last shown - so that the program doesn't always show the same tip on startup. As you also need to remember whether to show tips or not (you shouldn't do it if the user unchecked "Show tips on startup" checkbox in the dialog), you will probably want to store both the index of the last shown tip (as returned by *wxTipProvider::GetCurrentTip* (p. 1123) and the flag telling whether to show the tips at startup at all.

Printing overview

Classes: *wxPrintout* (p. 811), *wxPrinter* (p. 808), *wxPrintPreview* (p. 815), *wxPrinterDC* (p. 810), *wxPrintDialog* (p. 802), *wxPrintData* (p. 796), *wxPrintDialogData* (p. 803), *wxPageSetupDialog* (p. 762), *wxPageSetupDialogData* (p. 756)

The printing framework relies on the application to provide classes whose member functions can respond to particular requests, such as 'print this page' or 'does this page exist in the document?'. This method allows wxWindows to take over the housekeeping duties of turning preview pages, calling the print dialog box, creating the printer device context, and so on: the application can concentrate on the rendering of the information onto a device context.

The *document/view framework* (p. 1411) creates a default wxPrintout object for every view, calling wxView::OnDraw to achieve a prepackaged print/preview facility.

A document's printing ability is represented in an application by a derived wxPrintout class. This class prints a page on request, and can be passed to the Print function of a wxPrinter object to actually print the document, or can be passed to a wxPrintPreview object to initiate previewing. The following code (from the printing sample) shows how easy it is to initiate printing, previewing and the print setup dialog, once the wxPrintout functionality has been defined. Notice the use of MyPrintout for both printing and previewing. All the preview user interface functionality is taken care of by wxWindows. For details on how MyPrintout is defined, please look at the printout sample code.

```
    case WXPRINT_PRINT:
    {
      wxPrinter printer;
      MyPrintout printout("My printout");
      printer.Print(this, &printout, TRUE);
      break;
    }
    case WXPRINT_PREVIEW:
    {
      // Pass two printout objects: for preview, and possible printing.
      wxPrintPreview *preview = new wxPrintPreview(new MyPrintout, new
MyPrintout);
      wxPreviewFrame *frame = new wxPreviewFrame(preview, this, "Demo
Print Preview", 100, 100, 600, 650);
      frame->Centre(wxBOTH);
      frame->Initialize();
      frame->Show(TRUE);
      break;
    }
    case WXPRINT_PRINT_SETUP:
    {
      wxPrintDialog printerDialog(this);
      printerDialog.GetPrintData().SetSetupDialog(TRUE);
      printerDialog.Show(TRUE);
      break;
    }
```

Multithreading overview

Classes: *wxThread* (p. 1106), *wxMutex* (p. 735), *wxCriticalSection* (p. 179), *wxCondition* (p. 161)

wxWindows provides a complete set of classes encapsulating objects necessary in multithreaded (MT) programs: the *thread* (p. 1106) class itself and different synchronization objects: *mutexes* (p. 735) and *critical sections* (p. 179) with *conditions* (p. 161). The thread API in wxWindows resembles to POSIX1.c threads API (a.k.a. pthreads), although several functions have different names and some features inspired by Win32 thread API are there as well.

These classes will hopefully make writing MT programs easier and they also provide some extra error checking (compared to the native (be it Win32 or Posix) thread API), however it is still an non-trivial undertaking especially for large projects. Before starting an MT application (or starting to add MT features to an existing one) it is worth asking oneself if there is no easier and safer way to implement the same functionality. Of course, in some situations threads really make sense (classical example is a server application which launches a new thread for each new client), but in others it might be a very poor choice (example: launching a separate thread when doing a long computation to show a progress dialog). Other implementation choices are available: for the progress dialog example it is far better to do the calculations in the *idle handler* (p. 560) or call *wxYield()* (p. 1291) periodically to update the screen.

If you do decide to use threads in your application, it is strongly recommended that no more than one thread calls GUI functions. The thread sample shows that it *is* possible for many different threads to call GUI functions at once (all the threads created in the sample access GUI), but it is a very poor design choice for anything except an example. The design which uses one GUI thread and several worker threads which communicate with the main one using events is much more robust and will undoubtedly save you countless problems (example: under Win32 a thread can only access GDI objects such as pens, brushes, &c created by itself and not by the other threads).

For communication between threads, use *wxEvtHandler::AddPendingEvent* (p. 381)or its short version *wxPostEvent* (p. 1287). These functions have thread safe implementation so that they can be used as they are for sending event from one thread to another.

Drag and drop overview

Classes: *wxDataObject* (p. 197), *wxTextDataObject* (p. 1088), *wxDropSource* (p. 368), *wxDropTarget* (p. 370), *wxTextDropTarget* (p. 1096), *wxFileDropTarget* (p. 414)

Note that wxUSE_DRAG_AND_DROP must be defined in setup.h in order to use drag and drop in wxWindows.

See also: *wxDataObject overview* (p. 1432) and *DnD sample* (p. 1330)

It may be noted that data transfer to and from the clipboard is quite similar to data

transfer with drag and drop and the code to implement these two types is almost the same. In particular, both data transfer mechanisms store data in some kind of *wxDataObject* (p. 197)and identify its format(s) using the *wxDataFormat* (p. 195)class.

To be a *drag source*, i.e. to provide the data which may be dragged by user elsewhere, you should implement the following steps:

- **Preparation:** First of all, a data object must be created and initialized with the data you wish to drag. For example:

  ```
  wxTextDataObject my_data("This text will be dragged.");
  ```

- **Drag start:** To start dragging process (typically in response to a mouse click) you must call *wxDropSource::DoDragDrop* (p. 369)like this:

  ```
  wxDropSource dragSource( this );
  dragSource.SetData( my_data );
  wxDragResult result = dragSource.DoDragDrop( TRUE );
  ```

- **Dragging:** The call to DoDragDrop() blocks the program until the user release the mouse button (unless you override *GiveFeedback* (p. 370) function to do something special). When the mouse moves in a window of a program which understands the same drag-and-drop protocol (any program under Windows or any program supporting the XDnD protocol under X Windows), the corresponding *wxDropTarget* (p. 370) methods are called - see below.
- **Processing the result:** DoDragDrop() returns an *effect code* which is one of the values of `wxDragResult` enum (explained *here* (p. 370)):

  ```
  switch (result)
  {
      case wxDragCopy: /* copy the data */ break;
      case wxDragMove: /* move the data */ break;
      default:         /* do nothing */ break;
  }
  ```

To be a *drop target*, i.e. to receive the data dropped by user you should follow the instructions below:

- **Initialization:** For a window to be drop target, it needs to have an associated *wxDropTarget* (p. 370) object. Normally, you will call *wxWindow::SetDropTarget* (p. 1229) during window creation associating you drop target with it. You must derive a class from wxDropTarget and override its pure virtual methods. Alternatively, you may derive from *wxTextDropTarget* (p. 1096) or *wxFileDropTarget* (p. 414) and override their OnDropText() or OnDropFiles() method.
- **Drop:** When the user releases the mouse over a window, wxWindows queries the associated wxDropTarget object if it accepts the data. For this, a

> *wxDataObject* (p. 197) must be associated with the drop target and this data object will be responsible for the format negotiation between the drag source and the drop target. If all goes well, then *OnData* (p. 372) will get called and the wxDataObject belonging to the drop target can get filled with data.
> * **The end:** After processing the data, DoDragDrop() returns either wxDragCopy or wxDragMove depending on the state of the keys (<Ctrl>, <Shift> and <Alt>) at the moment of drop. There is currently no way for the drop target to change this return code.

wxDataObject overview

Classes: *wxDataObject* (p. 197), *wxClipboard* (p. 121), *wxDataFormat* (p. 195), *wxDropSource* (p. 368), *wxDropTarget* (p. 370)

See also: *Drag and drop overview* (p. 1430) and *DnD sample* (p. 1330)

This overview discusses data transfer through clipboard or drag and drop. In wxWindows, these two ways to transfer data (either between different applications or inside one and the same) are very similar which allows to implement both of them using almost the same code - or, in other words, if you implement drag and drop support for your application, you get clipboard support for free and vice versa.

At the heart of both clipboard and drag and drop operations lies the *wxDataObject* (p. 197) class. The objects of this class (or, to be precise, classes derived from it) represent the data which is being carried by the mouse during drag and drop operation or copied to or pasted from the clipboard. wxDataObject is a "smart" piece of data because it knows which formats it supports (see GetFormatCount and GetAllFormats) and knows how to render itself in any of them (see GetDataHere). It can also receive its value from the outside in a format it supports if it implements the SetData method. Please see the documentation of this class for more details.

Both clipboard and drag and drop operations have two sides: the source and target, the data provider and the data receiver. These which may be in the same application and even the same window when, for example, you drag some text from one position to another in a word processor. Let us describe what each of them should do.

The data provider (source) duties

The data provider is responsible for creating a *wxDataObject* (p. 197) containing the data to be transferred. Then it should either pass it to the clipboard using *SetData* (p. 124) function or to *wxDropSource* (p. 368) and call *DoDragDrop* (p. 369) function.

The only (but important) difference is that the object for the clipboard transfer must always be created on the heap (i.e. using `new`) and it will be freed by the clipboard when it is no longer needed (indeed, it is not known in advance when, if ever, the data will be pasted from the clipboard). On the other hand, the object for drag and drop operation

must only exist while *DoDragDrop* (p. 369) executes and may be safely deleted afterwards and so can be created either on heap or on stack (i.e. as a local variable).

Another small difference is that in the case of clipboard operation, the application usually knows in advance whether it copies or cuts (i.e. copies and deletes) data - in fact, this usually depends on which menu item the user chose. But for drag and drop it can only know it after *DoDragDrop* (p. 369) returns (from its return value).

The data receiver (target) duties

To receive (paste in usual terminology) data from the clipboard, you should create a *wxDataObject* (p. 197) derived class which supports the data formats you need and pass it as argument to *wxClipboard::GetData* (p. 123). If it returns FALSE, no data in (any of) the supported format(s) is available. If it returns TRUE, the data has been successfully transferred to wxDataObject.

For drag and drop case, the *wxDropTarget::OnData* (p. 372) virtual function will be called when a data object is dropped, from which the data itself may be requested by calling *wxDropTarget::GetData* (p. 371) method which fills the data object.

Database classes overview

Classes: *wxDatabase* (p. 188), *wxRecordSet* (p. 877), *wxQueryCol* (p. 855), *wxQueryField* (p. 858)

Note that more sophisticated ODBC classes are provided by the Remstar database classes: please see the separate HTML and Word documentation.

wxWindows provides a set of classes for accessing a subset of Microsoft's ODBC (Open Database Connectivity) product. Currently, this wrapper is available under MS Windows only, although ODBC may appear on other platforms, and a generic or product-specific SQL emulator for the ODBC classes may be provided in wxWindows at a later date.

ODBC presents a unified API (Application Programmer's Interface) to a wide variety of databases, by interfacing indirectly to each database or file via an ODBC driver. The language for most of the database operations is SQL, so you need to learn a small amount of SQL as well as the wxWindows ODBC wrapper API. Even though the databases may not be SQL-based, the ODBC drivers translate SQL into appropriate operations for the database or file: even text files have rudimentary ODBC support, along with dBASE, Access, Excel and other file formats.

The run-time files for ODBC are bundled with many existing database packages, including MS Office. The required header files, sql.h and sqlext.h, are bundled with several compilers including MS VC++ and Watcom C++. The only other way to obtain these header files is from the ODBC SDK, which is only available with the MS Developer Network CD-ROMs -- at great expense. If you have odbc.dll, you can make the required

import library odbc.lib using the tool 'implib'. You need to have odbc.lib in your compiler library path.

The minimum you need to distribute with your application is odbc.dll, which must go in the Windows system directory. For the application to function correctly, ODBC drivers must be installed on the user's machine. If you do not use the database classes, odbc.dll will be loaded but not called (so ODBC does not need to be setup fully if no ODBC calls will be made).

A sample is distributed with wxWindows in `samples/odbc`. You will need to install the sample dbf file as a data source using the ODBC setup utility, available from the control panel if ODBC has been fully installed.

Procedures for writing an ODBC application

You first need to create a wxDatabase object. If you want to get information from the ODBC manager instead of from a particular database (for example using *wxRecordSet::GetDataSources* (p. 882)), then you do not need to call *wxDatabase::Open* (p. 193). If you do wish to connect to a datasource, then call wxDatabase::Open. You can reuse your wxDatabase object, calling wxDatabase::Close and wxDatabase::Open multiple times.

Then, create a wxRecordSet object for retrieving or sending information. For ODBC manager information retrieval, you can create it as a dynaset (retrieve the information as needed) or a snapshot (get all the data at once). If you are going to call *wxRecordSet::ExecuteSQL* (p. 880), you need to create it as a snapshot. Dynaset mode is not yet implemented for user data.

Having called a function such as wxRecordSet::ExecuteSQL or wxRecordSet::GetDataSources, you may have a number of records associated with the recordset, if appropriate to the operation. You can now retrieve information such as the number of records retrieved and the actual data itself. Use *wxRecordSet::GetFieldData* (p. 883) or *wxRecordSet::GetFieldDataPtr* (p. 883) to get the data or a pointer to it, passing a column index or name. The data returned will be for the current record. To move around the records, use *wxRecordSet::MoveNext* (p. 888), *wxRecordSet::MovePrev* (p. 888) and associated functions.

You can use the same recordset for multiple operations, or delete the recordset and create a new one.

Note that when you delete a wxDatabase, any associated recordsets also get deleted, so beware of holding onto invalid pointers.

wxDatabase overview

Class: *wxDatabase* (p. 188)

Every database object represents an ODBC connection. To do anything useful with a

database object you need to bind a wxRecordSet object to it. All you can do with wxDatabase is opening/closing connections and getting some info about it (users, passwords, and so on).

See also

Database classes overview (p. 1433)

wxQueryCol overview

Class: *wxQueryCol* (p. 855)

Every data column is represented by an instance of this class. It contains the name and type of a column and a list of wxQueryFields where the real data is stored. The links to user-defined variables are stored here, as well.

See also

Database classes overview (p. 1433)

wxQueryField overview

Class: *wxQueryField* (p. 858)

As every data column is represented by an instance of the class wxQueryCol, every data item of a specific column is represented by an instance of wxQueryField. Each column contains a list of wxQueryFields. If wxRecordSet is of the type wxOPEN_TYPE_DYNASET, there will be only one field for each column, which will be updated every time you call functions like wxRecordSet::Move or wxRecordSet::GoTo. If wxRecordSet is of the type wxOPEN_TYPE_SNAPSHOT, all data returned by an ODBC function will be loaded at once and the number of wxQueryField instances for each column will depend on the number of records.

See also

Database classes overview (p. 1433)

wxRecordSet overview

Class: *wxRecordSet* (p. 877)

Each wxRecordSet represents a database query. You can make multiple queries at a time by using multiple wxRecordSets with a wxDatabase or you can make your queries in sequential order using the same wxRecordSet.

See also

Database classes overview (p. 1433)

ODBC SQL data types

These are the data types supported in ODBC SQL. Note that there are other, extended level conformance types, not currently supported in wxWindows.

CHAR(n)	A character string of fixed length *n*.
VARCHAR(n)	A varying length character string of maximum length *n*.
LONG VARCHAR(n)	A varying length character string: equivalent to VARCHAR for the purposes of ODBC.
DECIMAL(p, s)	An exact numeric of precision *p* and scale *s*.
NUMERIC(p, s)	Same as DECIMAL.
SMALLINT	A 2 byte integer.
INTEGER	A 4 byte integer.
REAL	A 4 byte floating point number.
FLOAT	An 8 byte floating point number.
DOUBLE PRECISION	Same as FLOAT.

These data types correspond to the following ODBC identifiers:

SQL_CHAR	A character string of fixed length.
SQL_VARCHAR	A varying length character string.
SQL_DECIMAL	An exact numeric.
SQL_NUMERIC	Same as SQL_DECIMAL.
SQL_SMALLINT	A 2 byte integer.
SQL_INTEGER	A 4 byte integer.
SQL_REAL	A 4 byte floating point number.
SQL_FLOAT	An 8 byte floating point number.
SQL_DOUBLE	Same as SQL_FLOAT.

See also

Database classes overview (p. 1433)

A selection of SQL commands

The following is a very brief description of some common SQL commands, with examples.

See also

Database classes overview (p. 1433)

Create

Creates a table.

Example:

```
CREATE TABLE Book
 (BookNumber      INTEGER     PRIMARY KEY
 , CategoryCode  CHAR(2)      DEFAULT 'RO' NOT NULL
 , Title          VARCHAR(100) UNIQUE
 , NumberOfPages SMALLINT
 , RetailPriceAmount NUMERIC(5,2)
 )
```

Insert

Inserts records into a table.

Example:

```
INSERT INTO Book
  (BookNumber, CategoryCode, Title)
  VALUES(5, 'HR', 'The Lark Ascending')
```

Select

The Select operation retrieves rows and columns from a table. The criteria for selection and the columns returned may be specified.

Examples:

```
SELECT * FROM Book
```

Selects all rows and columns from table Book.

```
SELECT Title, RetailPriceAmount FROM Book WHERE RetailPriceAmount >
20.0
```

Selects columns Title and RetailPriceAmount from table Book, returning only the rows that match the WHERE clause.

```
SELECT * FROM Book WHERE CatCode = 'LL' OR CatCode = 'RR'
```

Selects all columns from table Book, returning only the rows that match the WHERE clause.

```
SELECT * FROM Book WHERE CatCode IS NULL
```

Selects all columns from table Book, returning only rows where the CatCode column is NULL.

```
SELECT * FROM Book ORDER BY Title
```

Selects all columns from table Book, ordering by Title, in ascending order. To specify descending order, add DESC after the ORDER BY Title clause.

```
SELECT Title FROM Book WHERE RetailPriceAmount >= 20.0 AND
RetailPriceAmount <= 35.0
```

Selects records where RetailPriceAmount conforms to the WHERE expression.

Update

Updates records in a table.

Example:

```
UPDATE Incident SET X = 123 WHERE ASSET = 'BD34'
```

This example sets a field in column 'X' to the number 123, for the record where the column ASSET has the value 'BD34'.

Interprocess communication overview

Classes: *wxDDEServer* (p. 305), *wxDDEConnection* (p. 301), *wxDDEClient* (p. 300), *wxTCPServer* (p. 1072), *wxTCPConnection* (p. 1068), *wxTCPClient* (p. 1066)

wxWindows has a number of different classes to help with interprocess communication and network programming. This section only discusses one family of classes - the DDE-like protocol - but here's a list of other useful classes:

- *wxSocketEvent* (p. 963), *wxSocketBase* (p. 943), *wxSocketClient* (p. 960), *wxSocketServer* (p. 964): classes for the low-level TCP/IP API.
- *wxProtocol* (p. 853), *wxURL* (p. 1169), *wxFTP* (p. 469), wxHTTP: classes for programming popular Internet protocols.

Further information on these classes will be available in due course.

wxWindows has a high-level protocol based on Windows DDE. There are two implementations of this DDE-like protocol: one using real DDE running on Windows only, and another using TCP/IP (sockets) that runs on most platforms. Since the API is the same apart from the names of the classes, you should find it easy to switch between the two implementations.

The following description refers to 'DDE' but remember that the equivalent wxTCP... classes can be used in much the same way.

Three classes are central to the DDE API:

1. wxDDEClient. This represents the client application, and is used only within a client program.
2. wxDDEServer. This represents the server application, and is used only within a server program.
3. wxDDEConnection. This represents the connection from the current client or server to the other application (server or client), and can be used in both server and client programs. Most DDE transactions operate on this object.

Messages between applications are usually identified by three variables: connection object, topic name and item name. A data string is a fourth element of some messages. To create a connection (a conversation in Windows parlance), the client application sends the message MakeConnection to the client object, with a string service name to identify the server and a topic name to identify the topic for the duration of the connection. Under Unix, the service name must contain an integer port identifier.

The server then responds and either vetoes the connection or allows it. If allowed, a connection object is created which persists until the connection is closed. The connection object is then used for subsequent messages between client and server.

To create a working server, the programmer must:

1. Derive a class from wxDDEServer.
2. Override the handler OnAcceptConnection for accepting or rejecting a connection, on the basis of the topic argument. This member must create and return a connection object if the connection is accepted.
3. Create an instance of your server object, and call Create to activate it, giving it a service name.
4. Derive a class from wxDDEConnection.
5. Provide handlers for various messages that are sent to the server side of a wxDDEConnection.

To create a working client, the programmer must:

1. Derive a class from wxDDEClient.
2. Override the handler OnMakeConnection to create and return an appropriate connection object.
3. Create an instance of your client object.
4. Derive a class from wxDDEConnection.
5. Provide handlers for various messages that are sent to the client side of a wxDDEConnection.
6. When appropriate, create a new connection by sending a MakeConnection message to the client object, with arguments host name (processed in Unix only), service name, and topic name for this connection. The client object will call OnMakeConnection to create a connection object of the desired type.
7. Use the wxDDEConnection member functions to send messages to the server.

Data transfer

These are the ways that data can be transferred from one application to another.

- **Execute:** the client calls the server with a data string representing a command to be executed. This succeeds or fails, depending on the server's willingness to answer. If the client wants to find the result of the Execute command other than success or failure, it has to explicitly call Request.
- **Request:** the client asks the server for a particular data string associated with a given item string. If the server is unwilling to reply, the return value is NULL. Otherwise, the return value is a string (actually a pointer to the connection buffer, so it should not be deallocated by the application).
- **Poke:** The client sends a data string associated with an item string directly to the server. This succeeds or fails.
- **Advise:** The client asks to be advised of any change in data associated with a particular item. If the server agrees, the server will send an OnAdvise message to the client along with the item and data.

The default data type is wxCF_TEXT (ASCII text), and the default data size is the length of the null-terminated string. Windows-specific data types could also be used on the PC.

Examples

See the sample programs *server* and *client* in the IPC samples directory. Run the server, then the client. This demonstrates using the Execute, Request, and Poke commands from the client, together with an Advise loop: selecting an item in the server list box causes that item to be highlighted in the client list box.

More DDE details

A wxDDEClient object represents the client part of a client-server DDE (Dynamic Data Exchange) conversation (available in both Windows and Unix).

To create a client which can communicate with a suitable server, you need to derive a class from wxDDEConnection and another from wxDDEClient. The custom wxDDEConnection class will intercept communications in a 'conversation' with a server, and the custom wxDDEServer is required so that a user-overridden *wxDDEClient::OnMakeConnection* (p. 301) member can return a wxDDEConnection of the required class, when a connection is made.

For example:

```
class MyConnection: public wxDDEConnection
{
 public:
  MyConnection(void)::wxDDEConnection(ipc_buffer, 3999) {}
  ~MyConnection(void) { }
  bool OnAdvise(const wxString& topic, const wxString& item, char
*data, int size, wxIPCFormat format)
  { wxMessageBox(topic, data); }
};
```

```
class MyClient: public wxDDEClient
{
 public:
  MyClient(void) {}
  wxConnectionBase *OnMakeConnection(void) { return new MyConnection; }
};
```

Here, **MyConnection** will respond to *OnAdvise* (p. 303) messages sent by the server.

When the client application starts, it must create an instance of the derived wxDDEClient. In the following, command line arguments are used to pass the host name (the name of the machine the server is running on) and the server name (identifying the server process). Calling *wxDDEClient::MakeConnection* (p. 301) implicitly creates an instance of **MyConnection** if the request for a connection is accepted, and the client then requests an *Advise* loop from the server, where the server calls the client when data has changed.

```
  wxString server = "4242";
  wxString hostName;
  wxGetHostName(hostName);

  // Create a new client
  MyClient *client = new MyClient;
  connection = (MyConnection *)client->MakeConnection(hostName, server,
"IPC TEST");

  if (!connection)
  {
    wxMessageBox("Failed to make connection to server", "Client Demo
Error");
    return NULL;
  }
  connection->StartAdvise("Item");
```

Note that it is no longer necessary to call wxDDEInitialize or wxDDECleanUp, since wxWindows will do this itself if necessary.

Chapter 9 wxHTML Notes

This addendum is written by Vaclav Slavik, the author of the wxHTML library.

The wxHTML library provides classes for parsing and displaying HTML.

(It is not intended to be a high-end HTML browser. If you are looking for something like that try http://www.mozilla.org (`http://www.mozilla.org`))

wxHTML can be used as a generic rich text viewer - for example to display a nice About Box (like those of GNOME apps) or to display the result of database searching. There is a *wxFileSystem* (p. 425) class which allows you to use your own virtual file systems.

wxHtmlWindow supports tag handlers. This means that you can easily extend wxHtml library with new, unsupported tags. Not only that, you can even use your own application specific tags! See lib/mod_*.cpp files for details.

There is a generic (i.e. independent on wxHtmlWindow) wxHtmlParser class.

wxHTML quick start

Displaying HMTL

First of all, you must include <wx/wxhtml.h>.

Class *wxHtmlWindow* (p. 546) (derived from wxScrolledWindow) is used to display HTML documents. It has two important methods: *LoadPage* (p. 548) and *SetPage* (p. 551). LoadPage loads and displays HTML file while SetPage displays directly the passed **string**. See the example:

```
mywin -> LoadPage("test.htm");
mywin -> SetPage("<html><body>"
                "<h1>Error</h1>"
            "Some error occurred :-H)"
            "</body></hmtl>");
```

I think the difference is quite clear.

Displaying Help

See *wxHtmlHelpController* (p. 522).

Setting up wxHtmlWindow

Because wxHtmlWindow is derived from wxScrolledWindow and not from wxFrame, it

doesn't have visible frame. But the user usually want to see the title of HTML page displayed somewhere and frame's titlebar is ideal place for it.

wxHtmlWindow provides 2 methods in order to handle this: *SetRelatedFrame* (p. 551) and *SetRelatedStatusBar* (p. 551). See the example:

```
html = new wxHtmlWindow(this);
html -> SetRelatedFrame(this, "HTML : %%s");
html -> SetRelatedStatusBar(0);
```

The first command associates html object with it is parent frame (this points to wxFrame object there) and sets format of title. Page title "Hello, world!" will be displayed as "HTML : Hello, world!" in this example.

The second command sets which frame's status bar should be used to display browser's messages (such as "Loading..." or "Done" or hypertext links).

Customizing wxHtmlWindow

You can customize wxHtmlWindow by setting font size, font face and borders (space between border of window and displayed HTML). Related functions:

- *SetFonts* (p. 550)
- *SetBorders* (p. 549)
- *ReadCustomization* (p. 549)
- *WriteCustomization* (p. 552)

The last two functions are used to store user customization info wxConfig stuff (for example in the registry under Windows, or in a dotfile under Unix).

HTML Printing

The wxHTML library provides printing facilities with several levels of complexity.

The easiest way to print an HTML document is to use *wxHtmlEasyPrinting class* (p. 518). It lets you print HTML documents with only one command and you don't have to worry about deriving from the wxPrintout class at all. It is only a simple wrapper around the *wxHtmlPrintout* (p. 537), normal wxWindows printout class.

And finally there is the low level class *wxHtmlDCRenderer* (p. 515) which you can use to render HTML into a rectangular area on any DC. It supports rendering into multiple rectangles with the same width. (The most common use of this is placing one rectangle on each page or printing into two columns.)

Help Files Format

wxHTML library uses a reduced version of MS HTML Workshop format. Tex2RTF can produce these files when generating HTML, if you set **htmlWorkshopFiles** to **true** in your tex2rtf.ini file.

(See *wxHtmlHelpController* (p. 522) for help controller description.)

A **book** consists of three files: header file, contents file and index file. You can make a regular zip archive of these files, plus the HTML and any image files, for wxHTML (or helpview) to read; and the .zip file can optionally be renamed to .htb.

Header file (.hhp)

Header file must contain these lines (and may contain additional lines which are ignored) :

```
Contents file=@filename.hhc@
Index file=@filename.hhk@
Title=@title of your book@
Default topic=@default page to be displayed.htm@
```

All filenames (including the Default topic) are relative to the location of .hhp file.

Localization note: In addition, .hhp file may contain line

```
Charset=@rfc_charset@
```

which specifies what charset (e.g. "iso8859_1") was used in contents and index files. Please note that this line is incompatible with MS HTML Help Workshop and it would either silently remove it or complain with some error. See also *Writing non-English applications* (p. 1354).

Contents file (.hhc)

Contents file has HTML syntax and it can be parsed by regular HTML parser. It contains exactly one list (`<ul>`....`</ul>` statement):

```
<ul>

  <li> <object>
          <param name="Name" value="@topic name@">
        <param name="ID" value=@numeric_id@>
        <param name="Local" value="@filename.htm@">
      </object>
  <li> <object>
          <param name="Name" value="@topic name@">
        <param name="ID" value=@numeric_id@>
        <param name="Local" value="@filename.htm@">
      </object>
  ...

</ul>
```

You can modify value attributes of param tags. *topic name* is name of chapter/topic as is displayed in contents, *filename.htm* is HTML page name (relative to .hhp file) and *numeric_id* is optional - it is used only when you use *wxHtmlHelpController::Display(int)* (p. 524)

Items in the list may be nested - one `<li>` statement may contain a `<ul>` sub-statement:

```
<ul>

  <li> <object>
        <param name="Name" value="Top node">
      <param name="Local" value="top.htm">
      </object>
      <ul>
        <li> <object>
              <param name="Name" value="subnode in topnode">
            <param name="Local" value="subnode1.htm">
          </object>
       ...
      </ul>

  <li> <object>
        <param name="Name" value="Another Top">
      <param name="Local" value="top2.htm">
      </object>
  ...

</ul>
```

Index file (.hhk)

Index files have same format as contents file except that ID params are ignored and sublists are **not** allowed.

Input Filters

The wxHTML library provides a mechanism for reading and displaying files of many different file formats.

wxHtmlWindow::LoadPage (p. 548) can load not only HTML files but any known file. To make a file type known to wxHtmlWindow you must create a *wxHtmlFilter* (p. 521) filter and register it using *wxHtmlWindow::AddFilter* (p. 546).

Cells and Containers

This article describes mechanism used by *wxHtmlWinParser* (p. 552) and

wxHtmlWindow (p. 546) to parse and display HTML documents.

Cells

You can divide any text (or HTML) into small fragments. Let's call these fragments **cells**. Cell is for example one word, horizontal line, image or any other part of document. Each cell has width and height (except special "magic" cells with zero dimensions - e.g. colour changers or font changers).

See *wxHtmlCell* (p. 503).

Containers

Container is kind of cell that may contain sub-cells. Its size depends on number and sizes of its sub-cells (and also depends on width of window).

See *wxHtmlContainerCell* (p. 510), *wxHtmlCell::Layout* (p. 507).

Using Containers in Tag Handler

wxHtmlWinParser (p. 552) provides a user-friendly way of managing containers. It is based on the idea of opening and closing containers.

Use *OpenContainer* (p. 556) to open new a container *within an already opened container*. This new container is a *sub-container* of the old one. (If you want to create a new container with the same depth level you can call CloseContainer(); OpenContainer();.)

Use *CloseContaier* (p. 553) to close the container. This doesn't create a new container with same depth level but it returns "control" to the parent container.

It is clear there must be same number of calls to OpenContainer as to CloseContainer...

Example

This code creates a new paragraph (container at same depth level) with "Hello, world!":

```
m_WParser -> CloseContainer();
c = m_WParser -> OpenContainer();

m_WParser -> AddWord("Hello, ");
m_WParser -> AddWord("world!");

m_WParser -> CloseContainer();
m_WParser -> OpenContainer();
```

You can see that there was opened container before running the code. We closed it, created our own container, then closed our container and opened new container. The result was that we had *same depth level* after executing. This is general rule that should be followed by tag handlers: leave depth level of containers unmodified (in other words, number of OpenContainer and CloseContainer calls should be same within *HandleTag*

(p. 543)'s body).

Tag Handlers

The wxHTML library provides architecture of pluggable *tag handlers*. Tag handler is class that understands particular HTML tag (or tags) and is able to interpret it.

wxHtmlWinParser (p. 552) has static table of **modules**. Each module contains one or more tag handlers. Each time a new wxHtmlWinParser object is constructed all modules are scanned and handlers are added to wxHtmlParser's list of available handlers (note: wxHtmlParser's list is non-static).

How it works

Common tag handler's *HandleTag* (p. 543) method works in four steps:

1. Save state of parent parser into local variables
2. Change parser state according to tag's params
3. Parse text between the tag and paired ending tag (if present)
4. Restore original parser state

See *wxHtmlWinParser* (p. 552) for methods for modifying parser's state. In general you can do things like opening/closing containers, changing colors, fonts etc.

Providing own tag handlers

You should create new .cpp file and place following lines into it:

```
#include <mod_templ.h>
#include <forcelink.h>
FORCE_LINK_ME(yourmodulefilenamewithoutcpp)
```

Then you must define handlers and one module.

Tag handlers

The handler is derived from *wxHtmlWinTagHandler* (p. 558)(or directly from *wxHtmlTagHandler* (p. 542))

You can use set of macros to define the handler (see src/mod_*.cpp files for details). Handler definition must start with **TAG_HANDLER_BEGIN** macro and end with **TAG_HANDLER_END** macro. I strongly recommend to have a look at *include/wxhtml/mod_templ.h* file. Otherwise you won't understand the structure of macros. See macros reference:

TAG_HANDLER_BEGIN(*name*, *tags*)

Starts handler definition. *name* is handler identifier (in fact part of class name), *tags* is

string containing list of tags supported by this handler (in uppercase). This macro derives new class from wxHtmlWinTagHandler and implements it is *GetSupportedTags* (p. 543) method.

Example: TAG_HANDLER_BEGIN(FONTS, "B,I,U,T")

TAG_HANDLER_VARS

This macro starts block of variables definitions. (Variables are identical to class attributes.) Example:

```
TAG_HANDLER_BEGIN(VARS_ONLY, "CRAZYTAG")
    TAG_HANDLER_VARS
        int my_int_var;
      wxString something_else;
TAG_HANDLER_END(VARS_ONLY)
```

This macro is used only in rare cases.

TAG_HANDLER_CONSTR(*name*)

This macro supplies object constructor. *name* is same name as the one from TAG_HANDLER_BEGIN macro. Body of constructor follow after this macro (you must use and). Example:

```
TAG_HANDLER_BEGIN(VARS2, "CRAZYTAG")
    TAG_HANDLER_VARS
        int my_int_var;
    TAG_HANDLER_CONSTR(vars2)
        { // !!!!!!
          my_int_var = 666;
      } // !!!!!!
TAG_HANDLER_END(VARS2)
```

Never used in wxHTML :-)

TAG_HANDLER_PROC(*varib*)

This is very important macro. It defines *HandleTag* (p. 543)method. *varib* is name of parameter passed to the method, usually*tag*. Body of method follows after this macro. Note than you must use and ! Example:

```
TAG_HANDLER_BEGIN(TITLE, "TITLE")
    TAG_HANDLER_PROC(tag)
        {
          printf("TITLE found...\n");
      }
TAG_HANDLER_END(TITLE)
```

TAG_HANDLER_END(*name*)

Ends definition of tag handler *name*.

Tags Modules

You can use set of 3 macros TAGS_MODULE_BEGIN, TAGS_MODULE_ADD and TAGS_MODULE_END to inherit new module from *wxHtmlTagsModule* (p. 544) and to create instance of it. See macros reference:

TAGS_MODULE_BEGIN(*modname*)

Begins module definition. *modname* is part of class name and must be unique.

TAGS_MODULE_ADD(*name*)

Adds the handler to this module. *name* is the identifier from TAG_HANDLER_BEGIN.

TAGS_MODULE_END(*modname*)

Ends the definition of module.

Example:

```
TAGS_MODULE_BEGIN(Examples)
    TAGS_MODULE_ADD(VARS_ONLY)
    TAGS_MODULE_ADD(VARS2)
    TAGS_MODULE_ADD(TITLE)
TAGS_MODULE_END(Examples)
```

Tags supported by wxHTML

wxHTML is not full implementation of HTML standard. Instead, it supports most common tags so that it is possible to display *simple* HTML documents with it. (For example it works fine with pages created in Netscape Composer or generated by tex2rtf).

Following tables list all tags known to wxHTML, together with supported parameters. A tag has general form of `<tagname param_1 param_2 ... param_n>` where param_i is either `paramname="paramvalue"` or `paramname=paramvalue` - these two are equivalent. Unless stated otherwise, wxHTML is case-insensitive.

Table of common parameter values

We will use these substitutions in tags descriptions:

```
[alignment]       CENTER
                  LEFT
                  RIGHT
                  JUSTIFY

[v_alignment]     TOP
                  BOTTOM
```

```
            CENTER

[color]      #nnnnnn
             where n is hexadecimal digit

[fontsize]   -2
             -1
             +0
             +1
             +2
             +3
             +4
              1
              2
              3
              4
              5
              6
              7

[pixels]     integer value that represents dimension in pixels

[percent]    i%
             where i is integer

[url]        an URL

[string]     text string

[coords]     c(1),c(2),c(3),...,c(n)
             where c(i) is integer
```

List of supported tags

```
P            ALIGN=[alignment]

BR           ALIGN=[alignment]

DIV          ALIGN=[alignment]

CENTER

BLOCKQUOTE

TITLE

BODY         TEXT=[color]
             LINK=[color]
             BGCOLOR=[color]

HR           ALIGN=[alignment]
             SIZE=[pixels]
             WIDTH=[percent]
             WIDTH=[pixels]
```

```
FONT            COLOR=[color]
                SIZE=[fontsize]
        FACE=[comma-separated list of facenames]

U

B

I

EM

STRONG

CITE

ADDRESS

CODE

KBD

SAMP

TT

H1

H2

H3

H4

H5

H6

A               NAME=[string]
                HREF=[url]

PRE

LI

UL

OL

DL

DT

DD

TABLE           ALIGN=[alignment]
                WIDTH=[percent]
```

```
                    WIDTH=[pixels]
                    BORDER=[pixels]
                    VALIGN=[v_alignment]
                    BGCOLOR=[color]
                    CELLSPACING=[pixels]
                    CELLPADDING=[pixels]

TR                  ALIGN=[alignment]
                    VALIGN=[v_alignment]
                    BGCOLOR=[color]

TH                  ALIGN=[alignment]
                    VALIGN=[v_alignment]
                    BGCOLOR=[color]
                    WIDTH=[percent]
                    WIDTH=[pixels]
                    COLSPAN=[pixels]
                    ROWSPAN=[pixels]

TD                  ALIGN=[alignment]
                    VALIGN=[v_alignment]
                    BGCOLOR=[color]
                    WIDTH=[percent]
                    WIDTH=[pixels]
                    COLSPAN=[pixels]
                    ROWSPAN=[pixels]

IMG                 SRC=[url]
                    WIDTH=[pixels]
                    HEIGHT=[pixels]
                    ALIGN=TEXTTOP
                    ALIGN=CENTER
                    ALIGN=ABSCENTER
                    ALIGN=BOTTOM
                    USEMAP=[url]

MAP                 NAME=[string]

AREA                SHAPE=POLY
                    SHAPE=CIRCLE
                    SHAPE=RECT
                    COORDS=[coords]
                    HREF=[url]

META                HTTP-EQUIV="Content-Type"
                    CONTENT=[string]
```

Chapter 10 Property sheet classes

Introduction

The Property Sheet Classes help the programmer to specify complex dialogs and their relationship with their associated data. By specifying data as a wxPropertySheet containing wxProperty objects, the programmer can use a range of available or custom wxPropertyView classes to allow the user to edit this data. Classes derived from wxPropertyView act as mediators between the wxPropertySheet and the actual window (and associated panel items).

For example, the wxPropertyListView is a kind of wxPropertyView which displays data in a Visual Basic-style property list (see *the next section* (p. 1453) for screen shots). This is a listbox containing names and values, with an edit control and other optional controls via which the user edits the selected data item.

wxPropertyFormView is another kind of wxPropertyView which mediates between the data and a panel or dialog box which has already been created. This makes it a contender for the replacement of wxForm, since programmer-controlled layout is going to be much more satisfactory. If automatic layout is desired, then wxPropertyListView could be used instead.

The main intention of this class library was to provide property *list* behaviour, but it has been generalised as much as possible so that the concept of a property sheet and its viewers can reduce programming effort in a range of user interface tasks.

For further details on the classes and how they are used, please see *Property classes overview* (p. 1455).

The appearance and behaviour of a property list view

The property list, as seen in an increasing number of development tools such as Visual Basic and Delphi, is a convenient and compact method for displaying and editing a number of items without the need for one control per item, and without the need for designing a special form. The controls are as follows:

- A listbox showing the properties and their current values, which has double-click properties dependent on the nature of the current property;
- a text editing area at the top of the display, allowing the user to edit the currently selected property if appropriate;
- 'confirm' and 'cancel' buttons to confirm or cancel an edit (for the property, not the whole sheet);
- an optional list that appears when the user can make a choice from several

known possible values;
- a small Edit button to invoke 'detailed editing' (perhaps showing or hiding the above value list, or maybe invoking a common dialog);
- optional OK/Close, Cancel and Help buttons for the whole dialog.

The concept of 'detailed editing' versus quick editing gives the user a choice of editing mode, so novice and expert behaviour can be catered for, or the user can just use what he feels comfortable with.

Behaviour alters depending on the kind of property being edited. For example, a boolean value has the following behaviour:

- Double-clicking on the item toggles between TRUE and FALSE.
- Showing the value list enables the user to select TRUE or FALSE.
- The user may be able to type in the word TRUE or FALSE, or the edit control may be read-only to disallow this since it is error-prone.

A list of strings may pop up a dialog for editing them, a simple string just allows text editing, double-clicking a colour property may show a colour selector, double-clicking on a filename property may show a file selector (in addition to being able to type in the name in the edit control), etc.

Note that the 'type' of property, such as string or integer, does not necessarily determine the behaviour of the property. The programmer has to be able to specify different behaviours for the same type, depending on the meaning of the property. For example, a colour and a filename may both be strings, but their editing behaviour should be different. This is why objects of type wxPropertyValidator need to be used, to define behaviour for a given class of properties or even specific property name. Objects of class wxPropertyView contain a list of property registries, which enable reuse of bunches of these validators in different circumstances. Or a wxProperty can be explicitly set to use a particular validator object.

The following screen shot of the property classes test program shows the user editing a string, which is constrained to be one of three possible values.
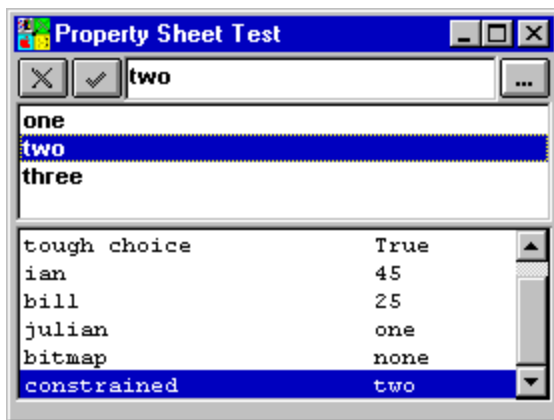
The second picture shows the user having entered a integer that was outside the range specified to the validator. Note that in this picture, the value list is hidden because it is

not used when editing an integer.
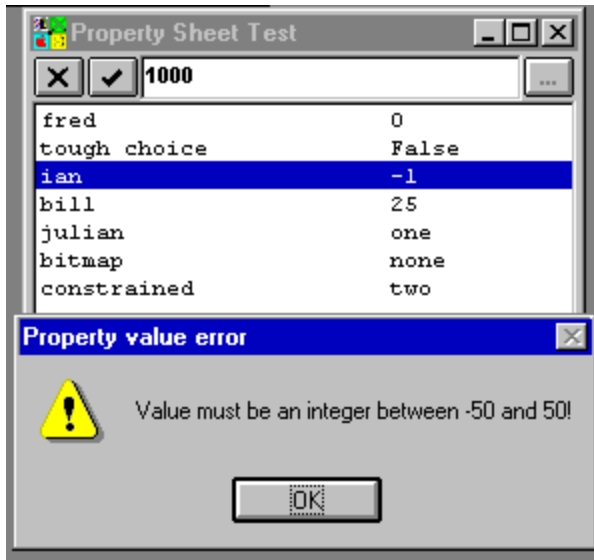
Headers

The property class library comprises the following files:

- prop.h: base property class header
- proplist.h: wxPropertyListView and associated classes
- propform.h: wxPropertyListView and associated classes

Topic overviews

This chapter contains a selection of topic overviews.

Property classes overview

The property classes help a programmer to express relationships between data and physical windows, in particular:

- the transfer of data to and from the physical controls;
- the behaviour of various controls and custom windows for particular types of data;
- the validation of data, notifying the user when incorrect data is entered, or even better, constraining the input so only valid data can be entered.

With a consistent framework, the programmer should be able to use existing components and design new ones in a principled manner, to solve many data entry requirements.

Each datum is represented in a *wxProperty* (p. 826), which has a name and a value. Various C++ types are permitted in the value of a property, and the property can store a pointer to the data instead of a copy of the data. A *wxPropertySheet* (p. 841) represents a number of these properties.

These two classes are independent from the way in which the data is visually manipulated. To mediate between property sheets and windows, the abstract class *wxPropertyView* (p. 851) is available for programmers to derive new kinds of view. One kind of view that is available is the *wxPropertyListView* (p. 839), which displays the data in a Visual Basic-style list, with a small number of controls for editing the currently selected property. Another is *wxPropertyFormView* (p. 832) which mediates between an existing dialog or panel and the property sheet.

The hard work of mediation is actually performed by validators, which are instances of classes derived from *wxPropertyValidator* (p. 843). A validator is associated with a particular property and is responsible for responding to user interface events, and displaying, updating and checking the property value. Because a validator's behaviour depends largely on the kind of view being used, there has to be a separate hierarchy of validators for each class of view. So for wxPropertyListView, there is an abstract class *wxPropertyListValidator* (p. 836) from which concrete classes are derived, such as *wxRealListValidator* (p. 872) and *wxStringListValidator* (p. 1036).

A validator can be explicitly set for a property, so there is no doubt which validator should be used to edit that property. However, it is also possible to define a registry of validators, and have the validator chosen on the basis of the *role* of the property. So a property with a "filename" role would match the "filename" validator, which pops up a file selector when the user double clicks on the property.

You don't have to define your own frame or window classes: there are some predefined that will work with the property list view. See *Window classes* (p. 1464) for further details.

Example 1: Property list view

The following code fragment shows the essentials of creating a registry of standard validators, a property sheet containing some properties, and a property list view and dialog or frame. RegisterValidators will be called on program start, and PropertySheetTest is called in response to a menu command.

Note how some properties are created with an explicit reference to a validator, and others are provided with a "role" which can be matched against a validator in the registry.

The interface generated by this test program is shown in the section *Appearance and behaviour of a property list view* (p. 1453).

```
void RegisterValidators(void)
{
  myListValidatorRegistry.RegisterValidator((wxString)"real", new
wxRealListValidator);
  myListValidatorRegistry.RegisterValidator((wxString)"string", new
wxStringListValidator);
  myListValidatorRegistry.RegisterValidator((wxString)"integer", new
wxIntegerListValidator);
  myListValidatorRegistry.RegisterValidator((wxString)"bool", new
wxBoolListValidator);
}

void PropertyListTest(Bool useDialog)
{
  wxPropertySheet *sheet = new wxPropertySheet;

  sheet->AddProperty(new wxProperty("fred", 1.0, "real"));
  sheet->AddProperty(new wxProperty("tough choice", (Bool)TRUE,
"bool"));
  sheet->AddProperty(new wxProperty("ian", (long)45, "integer", new
wxIntegerListValidator(-50, 50)));
  sheet->AddProperty(new wxProperty("bill", 25.0, "real", new
wxRealListValidator(0.0, 100.0)));
  sheet->AddProperty(new wxProperty("julian", "one", "string"));
  sheet->AddProperty(new wxProperty("bitmap", "none", "string", new
wxFilenameListValidator("Select a bitmap file", "*.bmp")));
  wxStringList *strings = new wxStringList("one", "two", "three",
NULL);
  sheet->AddProperty(new wxProperty("constrained", "one", "string", new
wxStringListValidator(strings)));

  wxPropertyListView *view =
    new wxPropertyListView(NULL,

wxPROP_BUTTON_CHECK_CROSS|wxPROP_DYNAMIC_VALUE_FIELD|wxPROP_PULLDOWN);

  wxDialogBox *propDialog = NULL;
  wxPropertyListFrame *propFrame = NULL;
  if (useDialog)
  {
    propDialog = new wxPropertyListDialog(view, NULL, "Property Sheet
Test", TRUE, -1, -1, 400, 500);
  }
  else
  {
    propFrame = new wxPropertyListFrame(view, NULL, "Property Sheet
Test", -1, -1, 400, 500);
  }

  view->AddRegistry(&myListValidatorRegistry);

  if (useDialog)
  {
    view->ShowView(sheet, propDialog);
    propDialog->Centre(wxBOTH);
    propDialog->Show(TRUE);
  }
```

```
  else
  {
    propFrame->Initialize();
    view->ShowView(sheet, propFrame->GetPropertyPanel());
    propFrame->Centre(wxBOTH);
    propFrame->Show(TRUE);
  }
}
```

Example 2: Property form view

This example is similar to Example 1, but uses a property form view to edit a property
sheet using a predefined dialog box.

```
void RegisterValidators(void)
{
  myFormValidatorRegistry.RegisterValidator((wxString)"real", new
wxRealFormValidator);
  myFormValidatorRegistry.RegisterValidator((wxString)"string", new
wxStringFormValidator);
  myFormValidatorRegistry.RegisterValidator((wxString)"integer", new
wxIntegerFormValidator);
  myFormValidatorRegistry.RegisterValidator((wxString)"bool", new
wxBoolFormValidator);
}

void PropertyFormTest(Bool useDialog)
{
  wxPropertySheet *sheet = new wxPropertySheet;

  sheet->AddProperty(new wxProperty("fred", 25.0, "real", new
wxRealFormValidator(0.0, 100.0)));
  sheet->AddProperty(new wxProperty("tough choice", (Bool)TRUE,
"bool"));
  sheet->AddProperty(new wxProperty("ian", (long)45, "integer", new
wxIntegerFormValidator(-50, 50)));
  sheet->AddProperty(new wxProperty("julian", "one", "string"));
  wxStringList *strings = new wxStringList("one", "two", "three",
NULL);
  sheet->AddProperty(new wxProperty("constrained", "one", "string", new
wxStringFormValidator(strings)));

  wxPropertyFormView *view = new wxPropertyFormView(NULL);

  wxDialogBox *propDialog = NULL;
  wxPropertyFormFrame *propFrame = NULL;
  if (useDialog)
  {
    propDialog = new wxPropertyFormDialog(view, NULL, "Property Form
Test", TRUE, -1, -1, 400, 300);
  }
  else
  {
    propFrame = new wxPropertyFormFrame(view, NULL, "Property Form
Test", -1, -1, 400, 300);
```

```
    propFrame->Initialize();
  }

  wxPanel *panel = propDialog ? propDialog : propFrame-
>GetPropertyPanel();
  panel->SetLabelPosition(wxVERTICAL);

  // Add items to the panel

  (void) new wxButton(panel, (wxFunction)NULL, "OK", -1, -1, -1, -1, 0,
"ok");
  (void) new wxButton(panel, (wxFunction)NULL, "Cancel", -1, -1, 80, -
1, 0, "cancel");
  (void) new wxButton(panel, (wxFunction)NULL, "Update", -1, -1, 80, -
1, 0, "update");
  (void) new wxButton(panel, (wxFunction)NULL, "Revert", -1, -1, -1, -
1, 0, "revert");
  panel->NewLine();

  // The name of this text item matches the "fred" property
  (void) new wxText(panel, (wxFunction)NULL, "Fred", "", -1, -1, 90, -
1, 0, "fred");
  (void) new wxCheckBox(panel, (wxFunction)NULL, "Yes or no", -1, -1, -
1, -1, 0, "tough choice");
  (void) new wxSlider(panel, (wxFunction)NULL, "Sliding scale", 0, -50,
50, 100, -1, -1, wxHORIZONTAL, "ian");
  panel->NewLine();
  (void) new wxListBox(panel, (wxFunction)NULL, "Constrained",
wxSINGLE, -1, -1, 100, 90, 0, NULL, 0, "constrained");

  view->AddRegistry(&myFormValidatorRegistry);

  if (useDialog)
  {
    view->ShowView(sheet, propDialog);
    view->AssociateNames();
    view->TransferToDialog();
    propDialog->Centre(wxBOTH);
    propDialog->Show(TRUE);
  }
  else
  {
    view->ShowView(sheet, propFrame->GetPropertyPanel());
    view->AssociateNames();
    view->TransferToDialog();
    propFrame->Centre(wxBOTH);
    propFrame->Show(TRUE);
  }
}
```

Validator classes overview

Classes: *Validator classes* (p. 1463)

The validator classes provide functionality for mediating between a wxProperty and the

actual display. There is a separate family of validator classes for each class of view, since the differences in user interface for these views implies that little common functionality can be shared amongst validators.

wxPropertyValidator overview

Class: *wxPropertyValidator* (p. 843)

This class is the root of all property validator classes. It contains a small amount of common functionality, including functions to convert between strings and C++ values.

A validator is notionally an object which sits between a property and its displayed value, and checks that the value the user enters is correct, giving an error message if the validation fails. In fact, the validator does more than that, and is akin to a view class but at a finer level of detail. It is also responsible for loading the dialog box control with the value from the property, putting it back into the property, preparing special controls for editing the value, and may even invoke special dialogs for editing the value in a convenient way.

In a property list dialog, there is quite a lot of scope for supplying custom dialogs, such as file or colour selectors. For a form dialog, there is less scope because there is no concept of 'detailed editing' of a value: one control is associated with one property, and there is no provision for invoking further dialogs. The reader may like to work out how the form view could be extended to provide some of the functionality of the property list!

Validator objects may be associated explicitly with a wxProperty, or they may be indirectly associated by virtue of a property 'kind' that matches validators having that kind. In the latter case, such validators are stored in a validator registry which is passed to the view before the dialog is shown. If the validator takes arguments, such as minimum and maximum values in the case of a wxIntegerListValidator, then the validator must be associated explicitly with the property. The validator will be deleted when the property is deleted.

wxPropertyListValidator overview

Class: *wxPropertyListValidator* (p. 836)

This class is the abstract base class for property list view validators. The list view acts upon a user interface containing a list of properties, a text item for direct property value editing, confirm/cancel buttons for the value, a pulldown list for making a choice between values, and OK/Cancel/Help buttons for the dialog (see *property list appearance* (p. 1453)).

By overriding virtual functions, the programmer can create custom behaviour for different kinds of property. Custom behaviour can use just the available controls on the property list dialog, or the validator can invoke custom editors with quite different controls, which pop up in 'detailed editing' mode.

See the detailed class documentation for the members you should override to give your

validator appropriate behaviour.

wxPropertyFormValidator overview

This class is the abstract base class for property form view validators. The form view acts upon an existing dialog box or panel, where either the panel item names correspond to property names, or the programmer has explicitly associated the panel item with the property.

By overriding virtual functions, the programmer determines how values are displayed or retrieved, and the checking that the validator does.

See the detailed class documentation for the members you should override to give your validator appropriate behaviour.

View classes overview

Classes: *View classes* (p. 1464)

An instance of a view class relates a property sheet with an actual window. Currently, there are two classes of view: wxPropertyListView and wxPropertyFormView.

wxPropertyView overview

Class: *wxPropertyView* (p. 851)

This is the abstract base class for property views.

wxPropertyListView overview

Class: *wxPropertyListView* (p. 839)

The property list view defines the relationship between a property sheet and a property list dialog or panel. It manages user interface events such as clicking on a property, pressing return in the text edit field, and clicking on Confirm or Cancel. These events cause member functions of the class to be called, and these in turn may call member functions of the appropriate validator to be called, to prepare controls, check the property value, invoke detailed editing, etc.

wxPropertyFormView overview

Class: *wxPropertyFormView* (p. 832)

The property form view manages the relationship between a property sheet and an existing dialog or panel.

You must first create a panel or dialog box for the view to work on. The panel should contain panel items with names that correspond to properties in your property sheet; or you can explicitly set the panel item for each property.

Apart from any custom panel items that you wish to control independently of the property-editing items, wxPropertyFormView takes over the processing of item events. It can also control normal dialog behaviour such as OK, Cancel, so you should also create some standard buttons that the property view can recognise. Just create the buttons with standard names and the view will do the rest. The following button names are recognised:

- **ok**: indicates the OK button. Calls wxPropertyFormView::OnOk. By default, checks and updates the form values, closes and deletes the frame or dialog, then deletes the view.
- **cancel**: indicates the Cancel button. Calls wxPropertyFormView::OnCancel. By default, closes and deletes the frame or dialog, then deletes the view.
- **help**: indicates the Help button. Calls wxPropertyFormView::OnHelp. This needs to be overridden by the application for anything interesting to happen.
- **revert**: indicates the Revert button. Calls wxPropertyFormView::OnRevert, which by default transfers the wxProperty values to the panel items (in effect undoing any unsaved changes in the items).
- **update**: indicates the Revert button. Calls wxPropertyFormView::OnUpdate, which by defaults transfers the displayed values to the wxProperty objects.

wxPropertySheet overview

Classes: *wxPropertySheet* (p. 841), *wxProperty* (p. 826), *wxPropertyValue* (p. 845)

A property sheet defines zero or more properties. This is a bit like an explicit representation of a C++ object. wxProperty objects can have values which are pointers to C++ values, or they can allocate their own storage for values.

Because the property sheet representation is explicit and can be manipulated by a program, it is a convenient form to be used for a variety of editing purposes. wxPropertyListView and wxPropertyFormView are two classes that specify the relationship between a property sheet and a user interface. You could imagine other uses for wxPropertySheet, for example to generate a form-like user interface without the need for GUI programming. Or for storing the names and values of command-line switches, with the option to subsequently edit these values using a wxPropertyListView.

A typical use for a property sheet is to represent values of an object which are only implicit in the current representation of it. For example, in Visual Basic and similar programming environments, you can 'edit a button', or rather, edit the button's properties. One of the properties you can edit is *width* - but there is no explicit representation of width in a wxWindows button; instead, you call SetSize and GetSize members. To translate this into a consistent, property-oriented scheme, we could derive a new class wxButtonWithProperties, which has two new functions: SetProperty and GetProperty. SetProperty accepts a property name and a value, and calls an

appropriate function for the property that is being passed. GetProperty accepts a property name, returning a property value. So instead of having to use the usual arbitrary set of C++ member functions to set or access attributes of a window, programmer deals merely with SetValue/GetValue, and property names and values. We now have a single point at which we can modify or query an object by specifying names and values at run-time. (The implementation of SetProperty and GetProperty is probably quite messy and involves a large if-then-else statement to test the property name and act accordingly.)

When the user invokes the property editor for a wxButtonWithProperties, the system creates a wxPropertySheet with 'imaginary' properties such as width, height, font size and so on. For each property, wxButtonWithProperties::GetProperty is called, and the result is passed to the corresponding wxProperty. The wxPropertySheet is passed to a wxPropertyListView as described elsewhere, and the user edits away. When the user has finished editing, the system calls wxButtonWithProperties::SetProperty to transfer the wxProperty value back into the button by way of an appropriate call, wxWindow::SetSize in the case of width and height properties.

Classes by category

A classification of property sheet classes by category.

Data classes

- *wxProperty* (p. 826)
- *wxPropertyValue* (p. 845)
- *wxPropertySheet* (p. 841)

Validator classes

Validators check that the values the user has entered for a property are valid. They can also define specific ways of entering data, such as a file selector for a filename, and they are responsible for transferring values between the wxProperty and the physical display.

Base classes:

- *wxPropertyValidator* (p. 826)
- *wxPropertyListValidator* (p. 836)
- *wxPropertyFormValidator* (p. 830)

List view validators:

- *wxBoolListValidator* (p. 77)
- *wxFilenameListValidator* (p. 424)

- *wxIntegerListValidator* (p. 598)
- *wxListOfStringsListValidator* (p. 651)
- *wxRealListValidator* (p. 872)
- *wxStringListValidator* (p. 1036)

Form view validators:

- *wxBoolFormValidator* (p. 77)
- *wxIntegerFormValidator* (p. 598)
- *wxRealFormValidator* (p. 871)
- *wxStringFormValidator* (p. 1034)

View classes

View classes mediate between a property sheet and a physical window.

- *wxPropertyView* (p. 851)
- *wxPropertyListView* (p. 839)
- *wxPropertyFormView* (p. 832)

Window classes

The class library defines some window classes that can be used as-is with a suitable view class and property sheet.

- *wxPropertyFormFrame* (p. 829)
- *wxPropertyFormDialog* (p. 828)
- *wxPropertyFormPanel* (p. 830)
- *wxPropertyListFrame* (p. 835)
- *wxPropertyListDialog* (p. 834)
- *wxPropertyListPanel* (p. 836)

Registry classes

A validator registry is a list of validators that can be applied to properties in a property sheet. There may be one or more registries per property view.

- *wxPropertyValidatorRegistry* (p. 844)

Chapter 11 wxPython Notes

This addendum is written by Robin Dunn, author of the wxPython wrapper

What is wxPython?

wxPython is a blending of the wxWindows GUI classes and thePython (`http://www.python.org/`) programming language.

Python

So what is Python? Go tohttp://www.python.org (`http://www.python.org`) to learn more, but in a nutshell Python is an interpreted, interactive, object-oriented programming language. It is often compared to Tcl, Perl, Scheme or Java.

Python combines remarkable power with very clear syntax. It has modules, classes, exceptions, very high level dynamic data types, and dynamic typing. There are interfaces to many system calls and libraries, and new built-in modules are easily written in C or C++. Python is also usable as an extension language for applications that need a programmable interface.

Python is copyrighted but freely usable and distributable, even for commercial use.

wxPython

wxPython is a Python package that can be imported at runtime that includes a collection of Python modules and an extension module (native code). It provides a series of Python classes that mirror (or shadow) many of the wxWindows GUI classes. This extension module attempts to mirror the class heirarchy of wxWindows as closely as possible. This means that there is a wxFrame class in wxPython that looks, smells, tastes and acts almost the same as the wxFrame class in the C++ version.

wxPython is very versitile. It can be used to create standalone GUI applications, or in situations where Python is embedded in a C++ application as an internal scripting or macro language.

Currently wxPython is available for Win32 platforms and the GTK toolkit (wxGTK) on most Unix/X-windows platforms. See the wxPython website http://wxPython.org/ (`http://wxPython.org/`) for details about getting wxPython working for you.

Why use wxPython?

So why would you want to use wxPython over just C++ and wxWindows? Personally I prefer using Python for everything. I only use C++ when I absolutely have to eek more performance out of an algorithm, and even then I usually code it as an extension module and leave the majority of the program in Python.

Another good thing to use wxPython for is quick prototyping of your wxWindows apps. With C++ you have to continuously go though the edit-compile-link-run cycle, which can be quite time consuming. With Python it is only an edit-run cycle. You can easily build an application in a few hours with Python that would normally take a few days or longer with C++. Converting a wxPython app to a C++/wxWindows app should be a straight forward task.

Other Python GUIs

There are other GUI solutions out there for Python.

Tkinter

Tkinter is the defacto standard GUI for Python. It is available on nearly every platform that Python and Tcl/TK are. Why Tcl/Tk? Well because Tkinter is just a wrapper around Tcl's GUI toolkit, Tk. This has its upsides and its downsides...

The upside is that Tk is a pretty versatile toolkit. It can be made to do a lot of things in a lot of different environments. It is fairly easy to create new widgets and use them interchangeably in your programs.

The downside is Tcl. When using Tkinter you actually have two separate language interpreters running, the Python interpreter and the Tcl interpreter for the GUI. Since the guts of Tcl is mostly about string processing, it is fairly slow as well. (Not too bad on a fast Pentium II, but you really notice the difference on slower machines.)

It wasn't until the latest version of Tcl/Tk that native Look and Feel was possible on non-Motif platforms. This is because Tk usually implements its own widgets (controls) even when there are native controls available.

Tkinter is a pretty low-level toolkit. You have to do a lot of work (verbose program code) to do things that would be much simpler with a higher level of abstraction.

PythonWin

PythonWin is an add-on package for Python for the Win32 platform. It includes wrappers for MFC as well as much of the Win32 API. Because of its foundation, it is very familiar for programmers who have experience with MFC and the Win32 API. It is obviously not compatible with other platforms and toolkits. PythonWin is organized as separate packages and modules so you can use the pieces you need without having to use the GUI portions.

Others

There are quite a few other GUI modules available for Python, some in active use, some that haven't been updated for ages. Most are simple wrappers around some C or C++ toolkit or another, and most are not cross-platform compatible. See this link (`http://www.python.org/download/Contributed.html#Graphics`)for a listing of a few of them.

Using wxPython

First things first...

I'm not going to try and teach the Python language here. You can do that at the Python Tutorial (`http://www.python.org/doc/tut/tut.html`). I'm also going to assume that you know a bit about wxWindows already, enough to notice the similarities in the classes used.

Take a look at the following wxPython program. You can find a similar program in the `wxPython/demo` directory, named `DialogUnits.py`. If your Python and wxPython are properly installed, you should be able to run it by issuing this command:

> `python` **DialogUnits.py**

```
001: ## import all of the wxPython GUI package
002: from wxPython.wx import *
003:
004: ## Create a new frame class, derived from the wxPython Frame.
005: class MyFrame(wxFrame):
006:
007:     def __init__(self, parent, id, title):
008:         # First, call the base class' __init__ method to create
the frame
009:         wxFrame.__init__(self, parent, id, title,
010:                             wxPoint(100, 100), wxSize(160, 100))
011:
012:         # Associate some events with methods of this class
013:         EVT_SIZE(self, self.OnSize)
014:         EVT_MOVE(self, self.OnMove)
015:
016:         # Add a panel and some controls to display the size and
position
017:         panel = wxPanel(self, -1)
018:         wxStaticText(panel, -1, "Size:",
019:                         wxDLG_PNT(panel, wxPoint(4, 4)),
wxDefaultSize)
020:         wxStaticText(panel, -1, "Pos:",
```

```
021:                           wxDLG_PNT(panel, wxPoint(4, 14)),
wxDefaultSize)
022:         self.sizeCtrl = wxTextCtrl(panel, -1, "",
023:                                     wxDLG_PNT(panel, wxPoint(24,
4)),
024:                                     wxDLG_SZE(panel, wxSize(36, -
1)),
025:                                     wxTE_READONLY)
026:         self.posCtrl = wxTextCtrl(panel, -1, "",
027:                                     wxDLG_PNT(panel, wxPoint(24,
14)),
028:                                     wxDLG_SZE(panel, wxSize(36, -
1)),
029:                                     wxTE_READONLY)
030:
031:
032:     # This method is called automatically when the CLOSE event is
033:     # sent to this window
034:     def OnCloseWindow(self, event):
035:         # tell the window to kill itself
036:         self.Destroy()
037:
038:     # This method is called by the system when the window is
resized,
039:     # because of the association above.
040:     def OnSize(self, event):
041:         size = event.GetSize()
042:         self.sizeCtrl.SetValue("%s, %s" % (size.width,
size.height))
043:
044:         # tell the event system to continue looking for an event
handler,
045:         # so the default handler will get called.
046:         event.Skip()
047:
048:     # This method is called by the system when the window is
moved,
049:     # because of the association above.
050:     def OnMove(self, event):
051:         pos = event.GetPosition()
052:         self.posCtrl.SetValue("%s, %s" % (pos.x, pos.y))
053:
054:
055: # Every wxWindows application must have a class derived from wxApp
056: class MyApp(wxApp):
057:
058:     # wxWindows calls this method to initialize the application
059:     def OnInit(self):
060:
061:         # Create an instance of our customized Frame class
062:         frame = MyFrame(NULL, -1, "This is a test")
063:         frame.Show(true)
064:
065:         # Tell wxWindows that this is our main window
066:         self.SetTopWindow(frame)
067:
068:         # Return a success flag
```

```
069:           return true
070:
071:
072: app = MyApp(0)      # Create an instance of the application class
073: app.MainLoop()      # Tell it to start processing events
074:
```

Things to notice

1. At line 2 the wxPython classes, constants, and etc. are imported into the current module's namespace. If you prefer to reduce namespace pollution you can use `"from wxPython import wx"` and then access all the wxPython identifiers through the wx module, for example, `"wx.wxFrame"`.

2. At line 13 the frame's sizing and moving events are connected to methods of the class. These helper functions are intended to be like the event table macros that wxWindows employs. But since static event tables are impossible with wxPython, we use helpers that are named the same to dynamically build the table. The only real difference is that the first argument to the event helpers is always the window that the event table entry should be added to.

3. Notice the use of `wxDLG_PNT` and `wxDLG_SZE` in lines 19 - 29 to convert from dialog units to pixels. These helpers are unique to wxPython since Python can't do method overloading like C++.

4. There is an `OnCloseWindow` method at line 34 but no call to EVT_CLOSE to attach the event to the method. Does it really get called? The answer is, yes it does. This is because many of the *standard* events are attached to windows that have the associated *standard* method names. I have tried to follow the lead of the C++ classes in this area to determine what is *standard* but since that changes from time to time I can make no guarantees, nor will it be fully documented. When in doubt, use an EVT_*** function.

5. At lines 17 to 21 notice that there are no saved references to the panel or the static text items that are created. Those of you who know Python might be wondering what happens when Python deletes these objects when they go out of scope. Do they disappear from the GUI? They don't. Remember that in wxPython the Python objects are just shadows of the corresponding C++ objects. Once the C++ windows and controls are attached to their parents, the parents manage them and delete them when necessary. For this reason, most wxPython objects do not need to have a __del__ method that explicitly causes the C++ object to be deleted. If you ever have the need to forcibly delete a window, use the Destroy() method as shown on line 36.

6. Just like wxWindows in C++, wxPython apps need to create a class derived from `wxApp` (line 56) that implements a method named `OnInit`, (line 59.) This method should create the application's main window (line 62) and use `wxApp.SetTopWindow()` (line 66) to inform wxWindows about it.

7. And finally, at line 72 an instance of the application class is created. At this point wxPython finishes initializing itself, and calls the `OnInit` method to get things started. (The zero parameter here is a flag for functionality that isn't quite implemented yet. Just ignore it for now.) The call to `MainLoop` at line 73 starts the event loop which continues until the application terminates or all the top level windows are closed.

wxWindows classes implemented in wxPython

The following classes are supported in wxPython. Most provide nearly full implementations of the public interfaces specified in the C++ documentation, others are less so. They will all be brought as close as possible to the C++ spec over time.

- *wxAcceleratorEntry* (p. 16)
- *wxAcceleratorTable* (p. 17)
- *wxActivateEvent* (p. 20)
- *wxBitmap* (p. 54)
- *wxBitmapButton* (p. 70)
- *wxBitmapDataObject* (p. 75)
- wxBMPHandler
- *wxBoxSizer* (p. 77)
- *wxBrush* (p. 80)
- *wxBusyInfo* (p. 89)
- *wxBusyCursor* (p. 88)
- *wxButton* (p. 89)
- *wxCalculateLayoutEvent* (p. 94)
- *wxCalendarCtrl* (p. 95)
- wxCaret
- *wxCheckBox* (p. 108)
- *wxCheckListBox* (p. 111)
- *wxChoice* (p. 113)
- *wxClientDC* (p. 121)
- *wxClipboard* (p. 121)
- *wxCloseEvent* (p. 125)
- *wxColourData* (p. 139)
- *wxColourDialog* (p. 142)
- *wxColour* (p. 136)
- *wxComboBox* (p. 144)
- *wxCommandEvent* (p. 153)
- *wxConfig* (p. 162)
- *wxControl* (p. 177)
- *wxCursor* (p. 184)
- *wxCustomDataObject* (p. 182)
- *wxDataFormat* (p. 195)
- *wxDataObject* (p. 197)

- *wxUpdateUIEvent* (p. 1166)
- *wxValidator* (p. 1172)
- *wxWindowDC* (p. 1240)
- *wxWindow* (p. 1190)
- wxZipFSHandler

Where to go for help

Since wxPython is a blending of multiple technologies, help comes from multiple sources. See http://wxpython.org/ (`http://wxpython.org/`) for details on various sources of help, but probably the best source is the wxPython-users mail list. You can view the archive or subscribe by going to

http://lists.sourceforge.net/mailman/listinfo/wxpython-users (`http://lists.sourceforge.net/mailman/listinfo/wxpython-users`)

Or you can send mail directly to the list using this address:

wxpython-users@lists.sourceforge.net

Chapter 12 Porting from wxWindows 1.xx

This addendum gives guidelines and tips for porting applications from version 1.xx of wxWindows to version 2.0.

The first section offers tips for writing 1.xx applications in a way to minimize porting time. The following sections detail the changes and how you can modify your application to be 2.0-compliant.

You may be worrying that porting to 2.0 will be a lot of work, particularly if you have only recently started using 1.xx. In fact, the wxWindows 2.0 API has far more in common with 1.xx than it has differences. The main challenges are using the new event system, doing without the default panel item layout, and the lack of automatic labels in some controls.

Please don't be freaked out by the jump to 2.0! For one thing, 1.xx is still available and will be supported by the user community for some time. And when you have changed to 2.0, we hope that you will appreciate the benefits in terms of greater flexibility, better user interface aesthetics, improved C++ conformance, improved compilation speed, and many other enhancements. The revised architecture of 2.0 will ensure that wxWindows can continue to evolve for the foreseeable future.

Please note that this document is a work in progress.

Preparing for version 2.0

Even before compiling with version 2.0, there's also a lot you can do right now to make porting relatively simple. Here are a few tips.

- **Use constraints or .wxr resources** for layout, rather than the default layout scheme. Constraints should be the same in 2.0, and resources will be translated.

- **Use separate wxMessage items** instead of labels for wxText, wxMultiText, wxChoice, wxComboBox. These labels will disappear in 2.0. Use separate wxMessages whether you're creating controls programmatically or using the dialog editor. The future dialog editor will be able to translate from old to new more accurately if labels are separated out.

- **Parameterise functions that use wxDC** or derivatives, i.e. make the wxDC an argument to all functions that do drawing. Minimise the use of wxWindow::GetDC and definitely don't store wxDCs long-term because in 2.0, you can't use GetDC() and wxDCs are not persistent. You will use wxClientDC, wxPaintDC stack objects instead. Minimising the use of GetDC() will ensure that there are very few places you have to change drawing code for 2.0.

- **Don't set GDI objects** (wxPen, wxBrush etc.) in windows or wxCanvasDCs before they're needed (e.g. in constructors) - do so within your drawing routine instead. In 2.0, these settings will only take effect between the construction and destruction of temporary wxClient/PaintDC objects.

- **Don't rely** on arguments to wxDC functions being floating point - they will be 32-bit integers in 2.0.

- **Don't use the wxCanvas member functions** that duplicate wxDC functions, such as SetPen and DrawLine, since they are going.

- **Using member callbacks** called from global callback functions will make the transition easier - see the FAQ for some notes on using member functions for callbacks. wxWindows 2.0 will banish global callback functions (and OnMenuCommand), and nearly all event handling will be done by functions taking a single event argument. So in future you will have code like:

```
void MyFrame::OnOK(wxCommandEvent&event)

        ...
```

  You may find that writing the extra code to call a member function isn't worth it at this stage, but the option is there.

- **Use wxString wherever possible.** 2.0 replaces char * with wxString in most cases, and if you use wxString to receive strings returned from wxWindows functions (except when you need to save the pointer if deallocation is required), there should be no conversion problems later on.

- Be aware that under Windows, **font sizes will change** to match standard Windows font sizes (for example, a 12-point font will appear bigger than before). Write your application to be flexible where fonts are concerned. Don't rely on fonts being similarly-sized across platforms, as they were (by chance) between Windows and X under wxWindows 1.66. Yes, this is not easy... but I think it is better to conform to the standards of each platform, and currently the size difference makes it difficult to conform to Windows UI standards. You may eventually wish to build in a global 'fudge-factor' to compensate for size differences. The old font sizing will still be available via wx_setup.h, so do not panic...

- **Consider dropping wxForm usage**: wxPropertyFormView can be used in a wxForm-like way, except that you specify a pre-constructed panel or dialog; or you can use a wxPropertyListView to show attributes in a scrolling list - you don't even need to lay panel items out.

  Because wxForm uses a number of features to be dropped in wxWindows 2.0, it cannot be supported in the future, at least in its present state.

- **When creating a wxListBox**, put the wxLB_SINGLE, wxLB_MULTIPLE,

wxLB_EXTENDED styles in the window style parameter, and put zero in the *multiple* parameter. The *multiple* parameter will be removed in 2.0.

- **For MDI applications**, don't reply on MDI being run-time-switchable in the way that the MDI sample is. In wxWindows 2.0, MDI functionality is separated into distinct classes.

The new event system

The way that events are handled has been radically changed in wxWindows 2.0. Please read the topic 'Event handling overview' in the wxWindows 2.0 manual for background on this.

Callbacks

Instead of callbacks for panel items, menu command events, control commands and other events are directed to the originating window, or an ancestor, or an event handler that has been plugged into the window or its ancestor. Event handlers always have one argument, a derivative of wxEvent.

For menubar commands, the **OnMenuCommand** member function will be replaced by a series of separate member functions, each of which responds to a particular command. You need to add these (non-virtual) functions to your frame class, add a DECLARE_EVENT_TABLE entry to the class, and then add an event table to your implementation file, as a BEGIN_EVENT_TABLE and END_EVENT_TABLE block. The individual event mapping macros will be of the form:

```
BEGIN_EVENT_TABLE(MyFrame, wxFrame)
    EVT_MENU(MYAPP_NEW, MyFrame::OnNew)
    EVT_MENU(wxID_EXIT, MyFrame::OnExit)
END_EVENT_TABLE()
```

Control commands, such as button commands, can be routed to a derived button class, the parent window, or even the frame. Here, you use a function of the form EVT_BUTTON(id, func). Similar macros exist for other control commands.

Other events

To intercept other events, you used to override virtual functions, such as OnSize. Now, while you can use the OnSize name for such event handlers (or any other name of your choice), it has only a single argument (wxSizeEvent) and must again be 'mapped' using the EVT_SIZE macro. The same goes for all other events, including OnClose (although in fact you can still use the old, virtual form of OnClose for the time being).

Class hierarchy

The class hierarchy has changed somewhat. wxToolBar and wxButtonBar classes have been split into several classes, and are derived from wxControl (which was called wxItem). wxPanel derives from wxWindow instead of from wxCanvas, which has disappeared in favour of wxScrolledWindow (since all windows are now effectively canvases which can be drawn into). The status bar has become a class in its own right, wxStatusBar.

There are new MDI classes so that wxFrame does not have to be overloaded with this functionality.

There are new device context classes, with wxPanelDC and wxCanvasDC disappearing. See *Device contexts and painting* (p. 1480).

GDI objects

These objects - instances of classes such as wxPen, wxBrush, wxBitmap (but not wxColour) - are now implemented with reference-counting. This makes assignment a very cheap operation, and also means that management of the resource is largely automatic. You now pass *references* to objects to functions such as wxDC::SetPen, not pointers, so you will need to dereference your pointers. The device context does not store a copy of the pen itself, but takes a copy of it (via reference counting), and the object's data gets freed up when the reference count goes to zero. The application does not have to worry so much about who the object belongs to: it can pass the reference, then destroy the object without leaving a dangling pointer inside the device context.

For the purposes of code migration, you can use the old style of object management - maintaining pointers to GDI objects, and using the FindOrCreate... functions. However, it is preferable to keep this explicit management to a minimum, instead creating objects on the fly as needed, on the stack, unless this causes too much of an overhead in your application.

At a minimum, you will have to make sure that calls to SetPen, SetBrush etc. work. Also, where you pass NULL to these functions, you will need to use an identifier such as wxNullPen or wxNullBrush.

Dialogs and controls

Labels

Most controls no longer have labels and values as they used to in 1.xx. Instead, labels

should be created separately using wxStaticText (the new name for wxMessage). This will need some reworking of dialogs, unfortunately; programmatic dialog creation that doesn't use constraints will be especially hard-hit. Perhaps take this opportunity to make more use of dialog resources or constraints. Or consider using the wxPropertyListView class which can do away with dialog layout issues altogether by presenting a list of editable properties.

Constructors

All window constructors have two main changes, apart from the label issue mentioned above. Windows now have integer identifiers; and position and size are now passed as wxPoint and wxSize objects. In addition, some windows have a wxValidator argument.

Show versus ShowModal

If you have used or overridden the **wxDialog::Show** function in the past, you may find that modal dialogs no longer work as expected. This is because the function for modal showing is now **wxDialog:ShowModal**. This is part of a more fundamental change in which a control may tell the dialog that it caused the dismissal of a dialog, by calling **wxDialog::EndModal** or **wxWindow::SetReturnCode**. Using this information, **ShowModal** now returns the id of the control that caused dismissal, giving greater feedback to the application than just TRUE or FALSE.

If you overrode or called **wxDialog::Show**, use **ShowModal** and test for a returned identifier, commonly wxID_OK or wxID_CANCEL.

wxItem

This is renamed wxControl.

wxText, wxMultiText and wxTextWindow

These classes no longer exist and are replaced by the single class wxTextCtrl. Multi-line text items are created using the wxTE_MULTILINE style.

wxButton

Bitmap buttons are now a separate class, instead of being part of wxBitmap.

wxMessage

Bitmap messages are now a separate class, wxStaticBitmap, and wxMessage is renamed wxStaticText.

wxGroupBox

wxGroupBox is renamed wxStaticBox.

wxForm

Note that wxForm is no longer supported in wxWindows 2.0. Consider using the

wxPropertyFormView class instead, which takes standard dialogs and panels and associates controls with property objects. You may also find that the new validation method, combined with dialog resources, is easier and more flexible than using wxForm.

Device contexts and painting

In wxWindows 2.0, device contexts are used for drawing into, as per 1.xx, but the way they are accessed and constructed is a bit different.

You no longer use **GetDC** to access device contexts for panels, dialogs and canvases. Instead, you create a temporary device context, which means that any window or control can be drawn into. The sort of device context you create depends on where your code is called from. If painting within an **OnPaint** handler, you create a wxPaintDC. If not within an **OnPaint** handler, you use a wxClientDC or wxWindowDC. You can still parameterise your drawing code so that it doesn't have to worry about what sort of device context to create - it uses the DC it is passed from other parts of the program.

You **must** create a wxPaintDC if you define an OnPaint handler, even if you do not actually use this device context, or painting will not work correctly under Windows.

If you used device context functions with wxPoint or wxIntPoint before, please note that wxPoint now contains integer members, and there is a new class wxRealPoint. wxIntPoint no longer exists.

wxMetaFile and wxMetaFileDC have been renamed to wxMetafile and wxMetafileDC.

Miscellaneous

Strings

wxString has replaced char* in the majority of cases. For passing strings into functions, this should not normally require you to change your code if the syntax is otherwise the same. This is because C++ will automatically convert a char* or const char* to a wxString by virtue of appropriate wxString constructors.

However, when a wxString is returned from a function in wxWindows 2.0 where a char* was returned in wxWindows 1.xx, your application will need to be changed. Usually you can simplify your application's allocation and deallocation of memory for the returned string, and simply assign the result to a wxString object. For example, replace this:

```
char* s = wxFunctionThatReturnsString();
```

```
s = copystring(s); // Take a copy in case it is temporary
.... // Do something with it
delete[] s;
```

with this:

```
wxString s = wxFunctionThatReturnsString();
.... // Do something with it
```

To indicate an empty return value or a problem, a function may return either the empty string ("") or a null string. You can check for a null string with wxString::IsNull().

Use of const

The **const** keyword is now used to denote constant functions that do not affect the object, and for function arguments to denote that the object passed cannot be changed.

This should not affect your application except for where you are overriding virtual functions which now have a different signature. If functions are not being called which were previously, check whether there is a parameter mismatch (or function type mismatch) involving consts.

Try to use the **const** keyword in your own code where possible.

Backward compatibility

Some wxWindows 1.xx functionality has been left to ease the transition to 2.0. This functionality (usually) only works if you compile with WXWIN_COMPATIBILITY set to 1 in setup.h.

Mostly this defines old names to be the new names (e.g. wxRectangle is defined to be wxRect).

Quick reference

This section allows you to quickly find features that need to be converted.

Include files

Use the form:

```
#include <wx/wx.h>
#include <wx/button.h>
```

For precompiled header support, use this form:

```
// For compilers that support precompilation, includes "wx.h".
#include <wx/wxprec.h>

#ifdef __BORLANDC__
    #pragma hdrstop
#endif

// Any files you want to include if not precompiling by including
// the whole of <wx/wx.h>
#ifndef WX_PRECOMP
    #include <stdio.h>
    #include <wx/setup.h>
    #include <wx/bitmap.h>
    #include <wx/brush.h>
#endif

// Any files you want to include regardless of precompiled headers
#include <wx/toolbar.h>
```

IPC classes

These are now separated out into wxDDEServer/Client/Connection (Windows only) and wxTCPServer/Client/Connection (Windows and Unix). Take care to use wxString for your overridden function arguments, instead of char*, as per the documentation.

MDI style frames

MDI is now implemented as a family of separate classes, so you can't switch to MDI just by using a different frame style. Please see the documentation for the MDI frame classes, and the MDI sample may be helpful too.

OnActivate

Replace the arguments with one wxActivateEvent& argument, make sure the function isn't virtual, and add an EVT_ACTIVATE event table entry.

OnChar

This is now a non-virtual function, with the same wxKeyEvent& argument as before. Add an EVT_CHAR macro to the event table for your window, and the implementation of

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your function will need very few changes.

OnClose

The old virtual function OnClose is now obsolete. Add an OnCloseWindow event handler using an EVT_CLOSE event table entry. For details about window destruction, see the Windows Deletion Overview in the manual. This is a subtle topic so please read it very carefully. Basically, OnCloseWindow is now responsible for destroying a window with Destroy(), but the default implementation (for example for wxDialog) may not destroy the window, so to be sure, always provide this event handler so it is obvious what's going on.

OnEvent

This is now a non-virtual function, with the same wxMouseEvent& argument as before. However you may wish to rename it OnMouseEvent. Add an EVT_MOUSE_EVENTS macro to the event table for your window, and the implementation of your function will need very few changes. However, if you wish to intercept different events using different functions, you can specify specific events in your event table, such as EVT_LEFT_DOWN.

Your OnEvent function is likely to have references to GetDC(), so make sure you create a wxClientDC instead. See *Device contexts* (p. 1480).

If you are using a wxScrolledWindow (formerly wxCanvas), you should call PrepareDC(dc) to set the correct translation for the current scroll position.

OnMenuCommand

You need to replace this virtual function with a series of non-virtual functions, one for each case of your old switch statement. Each function takes a wxCommandEvent& argument. Create an event table for your frame containing EVT_MENU macros, and insert DECLARE_EVENT_TABLE() in your frame class, as per the samples.

OnPaint

This is now a non-virtual function, with a wxPaintEvent& argument. Add an EVT_PAINT macro to the event table for your window.

Your function *must* create a wxPaintDC object, instead of using GetDC to obtain the device context.

If you are using a wxScrolledWindow (formerly wxCanvas), you should call PrepareDC(dc) to set the correct translation for the current scroll position.

OnSize

Replace the arguments with one wxSizeEvent& argument, make it non-virtual, and add to your event table using EVT_SIZE.

wxApp definition

The definition of OnInit has changed. Return a bool value, not a wxFrame.

Also, do *not* declare a global application object. Instead, use the macros DECLARE_APP and IMPLEMENT_APP as per the samples. Remove any occurrences of IMPLEMENT_WXWIN_MAIN: this is subsumed in IMPLEMENT_APP.

wxButton

For bitmap buttons, use wxBitmapButton.

wxCanvas

Change the name to wxScrolledWindow.

wxDialogBox

Change the name to wxDialog, and for modal dialogs, use ShowModal instead of Show.

wxDialog::Show

If you used **Show** to show a modal dialog or to override the standard modal dialog **Show**, use **ShowModal** instead.

See also

Dialogs and controls (p. 1478)

wxForm

Sorry, this class is no longer available. Try using the wxPropertyListView or wxPropertyFormView class instead, or use .wxr files and validators.

wxPoint

The old wxPoint is called wxRealPoint, and wxPoint now uses integers.

wxRectangle

This is now called wxRect.

wxScrollBar

The function names have changed for this class: please refer to the documentation for wxScrollBar. Instead of setting properties individually, you will call SetScrollbar with several parameters.

wxText, wxMultiText, wxTextWindow

Change all these to wxTextCtrl. Add the window style wxTE_MULTILINE if you wish to have a multi-line text control.

wxToolBar

This name is an alias for the most popular form of toolbar for your platform. There is now a family of toolbar classes, with for example wxToolBar95, wxToolBarMSW and wxToolBarSimple classes existing under Windows 95.

Toolbar management is supported by frames, so calling wxFrame::CreateToolBar and adding tools is usually enough, and the SDI or MDI frame will manage the positioning for you. The client area of the frame is the space left over when the menu bar, toolbar and status bar have been taken into account.

Chapter 13 References

[1] **Robins, Gabriel**. 1987 (September). *The ISI grapher: a portable tool for displaying graphs pictorially (ISI/RS-87-196).* Technical report. University of South California.

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