SwanSim Fortran Development in Windows



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1 The Options

In the Linux ecosystem, the availability of C, C++ and Fortran is commonplace via the GNU Compiler collection. These compilers are renown for being stable, producing code which performs well and being kept up to date with the latest standards in each of the languages – but equally important, they are free.

In the world of Windows, if you are not using Fortran, then the choice became relatively straightforward when Microsoft released the Community Edition of Visual Studio as a free product. This is widely regarded as being one of the best IDEs and is compatible with many languages – except Fortran.

If you require Fortran, then Intel produce a compiler that integrates seamlessly into Visual Studio but it is expensive. If you require a free development environment which incorporates C, C++ and Fortran then a combination of the Code::Blocks IDE and the MinGW compiler suite (these are the GNU compilers built for Windows) has proven to be effective. Unfortunately, the installation of these tools is not as straightforward as it could be. The remainder of this document guides you through the download, installation and setup process.

2 Installation

Code::Blocks is available can be downloaded from http://www.codeblocks.org/. There is a download that comes bundled with the MinGW compilers and uses a simple installer. However, these compilers are limited to producing 32-bit software which has a number of disadvantages:

- 32 bit software is limited to using 2Gb of memory
- 3rd-party libraries are increasingly dropping support for 32-bit versions of their software as the nearly all new installations of Windows are 64-bit.

In order to use Code::Blocks with 64 bit compilers, Code::Blocks and the compiler suite must be downloaded and installed separately.

2.1 Installing MingW-w64 Compilers

The steps for downloading the compilers is shown below:

- 1. Download the latest Mingw-w64 compilers
 - a. Go to <u>http://www.mingw-w64.org</u> and then click on the 'Downloads' link.
 - b. When you go to the Download page you will be presented with a number of 'Pre-built toolchains and packages'.
 - c. Select the 'Mingw-builds' set (For some reason it doesn't have FORTRAN listed but it is included in the download).

a 🗋 www	.mingw-w	64.org/dok	u.php/download		
Downl	oads				
he heart of t ome of GCC	ne Mingw-v nor of binu	w64 project i itils, several	s headers and support li sets of installation packa	braries to run the output of GCC o iges which combine them are avail	n Windows. Since Mingw-w64 is neither the lable.
n addition, th	e sources a	are available	but most people will war	nt to grab binaries directly.	
Pre-built	toolch	ains and	l packages		
	Version	Host	GCC / Mingw-w64 Version	Languages	Additional Software in Package Manager
Arch Linux	Arch Linux Rolling		4.9.2/4.0.2	Ada, C, C++, Fortran, Obj-C, Obj-C++	305, full list. Show
Cygwin			4.9.2/4.0.2	Ada, C, C++, Fortran, Obj-C	5 (bzip2, libgcrypt, libgpg-error, minizip, xz, zlib)
0	Debian 7	(Wheezy)	4.6.3/2.0.3	Ada, C. C++, Fortran, Obi-C.	2.202
Debian	Debian 8	(Jessie)	4.9.1/3.2.0	Obj-C++	2 (gad, nsis)
Ð	Fedora 1	9	4.8.1/?	Ada, C, C++, Fortran, Obj-C, Obj-C++	149, full list show
Mingwa		Windows	4.8.2/trunk		
builds	Rolling		4.9.2/trunk	C, C++	4 (gdb, libiconf, python, zlib)
		Mindown			

- d. It will then present you with a link to the SourceForge web site and the download will commence.
- 2. Install the latest Mingw-w64 compilers
 - a. Run the installer
 - b. Click 'Next' to get to the 'Settings' panel. Change the Architecture to 'x86_64' and then select 'Next'.



c. The Destination folder is now shown. It is best to change this to a shorter path with no spaces. A typical example would be 'C:\MingW' as shown below.

彩	Installing >	(86_64-5.2.0-posix-	seh-rt_v4-rev) – 🗆 🗙
Installa Sele be in	ation folder ct a destination folder astalled.	where x86_64-5.2.0-	-posix-seh-rt_v4	-rev0 will 👩
Setup If you folder, Dest	will install files in the would like to install x click Browse and sel-	following folder. 86_64-5.2.0-posix-se ect another folder.	th-rt_v4-rev0 int	o a different
C:	\MingW			Browse
Space Cre MinGW-W	available: 234.36 GE aate shortcuts in Start 164	i : Menu		
		< <u>B</u> ack	<u>N</u> ext >	Gancel

d. Selecting 'Next' again will start the installation.

To st	op or pause	the installation	on process, cli	ck Cancel.		
	51	Downloading	file			
	The.	x80_04-3.2.0	-release-posis	-sen-n_v4-nevo.	12	

e. Finish the installation by selecting 'Next' and 'Finish'

2.2 Installing Code::Blocks

- 1. Go to <u>http://www.codeblocks.org</u>
- 2. Click on 'Downloads'
- 3. Click on 'Download the binary release'
- 4. Scroll down to the 'Windows 2000 / XP / Vista / 7' section
- 5. Click to download the Code::Blocks setup.exe file (do not choose any links which name 'mingw')

C www.codeble	ocks.org/downloads/26			5
User manual Licensing Donations Quick links	MOR, we have minimized air me releases at Sourcer orge, IMPORTANT NOTE: If you try to download from BerliOS download the file. According to a BerliOS - admin, this c Alternatively use on of the mirrors.	and get a "Too man an happen several tir	s managed by us. y clients!" - error, you should retry to nes, before the download starts.	
FAQ Wiki Forums	NOTE: We have a Changelog for 13.12, that gives you new release.	an overview over the	enhancements and fixes we have put in the	
 Forums (mobile) Nightlies Ticket System 	Windows 2000 / XP / Vista / 7:			
Browse SVN	File	Date	Download from	
Browse SVN log	codeblocks-13.12-setup.exe	27 Dec 2013	BerliOS or Sourceforge.net	
GPL 3	codeblocks-13.12mingw-setup.exe	27 Dec 2013	BerliOS or Sourceforge.net	
built with	codeblocks-13.12mingw-setup-TDM-GCC-481.exe	27 Dec 2013	BerliOS or Sourceforge.net	
W3C css	NOTE: The codeblocks-13.12mingw-setup.exe file <i>inclut</i> (version 4.7.1, 32 bit). The codeblocks-13.12mingw-setu version 4.8.1, 32 bit. While v4.7.1 is nock-solid (we use i some known bugs with this version related to the compil	des the GCC compile p-TDM-GCC-481.exe t to compile C::B), v4 ation of Code::Blocks	r and GDB debugger from TDM-GCC file includes the TDM-GCC compiler, I.8.1 is provided for convenience, there are s itself.	
GetFirefox	IF UNSURE, USE "codeblocks-13.12mingw-setup.exe"I			
sourceforge				
	A Linux 32-bit:			

- 6. Run the Installer
- 7. Click through each of the panels without changing any settings.

2.3 Configuring Code::Blocks

Once Code::Blocks is installed it needs to be configured to find the compilers. This is performed once only.

1. Run Code::Blocks. The first time this is run it will try to find compilers to use but will probably not be able to find any. Click 'OK' anyway.

(If you have also Visual Studio installed then it may find those compilers)

Compiler	Status	^	Set as defaul
GNU GCC Compiler	Not found		
	Not found		
Microsoft Visual C++ 2005/2008	Not found		
Microsoft Visual C++ 2010	Not found		
Borland C++ Compiler (5.5, 5.82)	Not found		
Digital Mars Compiler	Not found		
OpenWatcom (W32) Compler	Not found		
Cygwin GCC	Not found		
LCC Complier	Not found		
Intel C/C++ Compiler	Not found		
Small Device C Compiler	Not found		
Tiny C Compiler	Not found		
Constant Charles Constant	Mathemat	~	

2. The next panel asks if you want Code::Blocks to be the default tool to open C/C++ files. If you are only going to use Code::Blocks then you may leave this as the default option. If you do not want to then just select the option 'No, leave everything as it is'.



3. Once Code::Blocks has started, go to the 'Settings' menu and select 'Compiler'.

		Globa	compiler :	settings		
	Selected compiler					
202	GNU GCC Compile	er				~
		Set	as default	Copy Rename	Delete	Reset defaults
lobal compiler settings	Compiler settings	Linker settings	Search directories	Toolchain executables	Custom variables	Build options
ànte	Policy:					Ŷ
	Compiler Flags	Other options	#defines			
	Categories:					
	<all categorie<="" td=""><td>55></td><td></td><td></td><td></td><td>~</td></all>	55>				~
Batch builds	Profile coo In C mode Enable all Enable ex Stop comp Inhibit all Have g+4 Have g+4	de when execute e, support all ISO common compiler tra compiler warr pling after first e warring message + follow the 1998 + follow the C++	d [-pg] C90 programs. In C- warnings (overrides nings [-Wextra] rorr [-Wfatal-errors] is [-w] ISO C++ language s ig C++0x ISO C++ language	++ mode, remove GNU (many other settings) [tandard [-std=c++98] anguage standard [-stc	extensions that conf Wall] I=c++0x]	lict with ISO C+

- 4. We now need to tell Code::Blocks where the C and C++ compilers are installed. Go to the 'Toolchain executables' tab.
 - a. Under 'Compilers installation directory', you need to browse to the folder containing the compilers you installed previously.
 - b. For each of the entries in the section below you need to browse to the 'bin' folder and select the correct executable. If everything was installed as per these instructions you should end up with a panel looking like this:

	Gl	bal compiler settings	
0.0	Selected compiler		
SA	GNU GCC Compiler		~
		Set as default Copy Rename Delete	Reset defaults
Slobal compiler settings	Compiler settings Linker s	ttings Search directories Toolchain executables Custom var	iables Build options (•
Profiler settings	Compiler's installation dir	ctory	
	C: WingW/mingw64		Auto-detect
	NOTE: All programs mut	exist either in the "bin" sub-directory of this path, or in any of the	e "Additional paths"
	Program Files Addition	Paths	
	C compiler:	gcc.exe	
	C++ compiler:	g++.exe	
	Linker for dynamic libs:	g++.exe	
	Linker for static lbs:		
	Dohuman		
	Debugger :	Invalid debugger	~
	Resource compiler:	windres.exe	
	Make program:	mingw32-make.exe	
]			
		OK Cancel	

- c. Click 'OK'.
- 5. We now need to do the same for the FORTRAN compilers.
 - a. Select 'GNU Fortran Compiler' from the menu at the top of the panel, browse to the same compiler installation folder and then choose gfortran for the top 3 entries as shown below.



b. Do the same for the 'G95 Fortran Compiler' – this is also called 'gfortran.exe'.

and a	selected compiler					
201	G95 Fortran Compiler					
~~~		Set as default	Copy Rename	Delete	Reset defaults	
Slobal compiler settings	Compiler settings Linker s	ettings Search directories	Toolchain executables	Custom variables	Build options	
	Compiler's installation di	rectory				
	C: WingW/mingw64				Auto-detect	
	NOTE: All programs must exist either in the "bin" sub-directory of this path, or in any of the "Additional paths"					
	Program Files Addition	al Paths				
Profiler settings	C compiler:	gfortran.exe				
-04	C++ compiler:	gfortran.exe				
	Linker for dynamic libs:	gfortran.exe				
	Linker for static lbs: ar.exe					
Batch builds	Debugger:	Invalid debugger			*	
	Resource compiler:	windres.exe				
	Make program:	mingw32-make.exe				
	Place program.	mingw.32-make.exe				