Appendix A Setting up an Eclipse C++ IDE on Windows

In this appendix, we illustrate how to set up an Eclipse C++ IDE on a Windows PC with Cygwin and GCC g++.

A.1 INSTALLING CYGWIN

Follow the below steps to install Cygwin on your PC:

- 1 Visit http://www.cygwin.com/install.html and click on *setup.exe* under "Installing and Updating Cygwin."
- 2 Click Run and you should see a screen similar to Figure A.1. Note the Cygwin version of 2.774 (you may choose the newest version).
- 3 Click Next and you should see a screen similar to Figure A.2.
- 4 Choose "*Install from Internet*," click Next and you should see a screen similar to Figure A.3. Select a folder (c:\mspc\cygwin in my case) for *Root Directory* and click Next. Select a folder for *Local Package Directory*.
- 5 Click Next and you should see a screen similar to Figure A.4. Choose "*Direct Connection*" and click Next. Now you should see a screen similar to Figure A.5.
- 6 Choose a download site. Note that not all download sites may work, so you may want to try different ones until a working one is found. Click Next to start downloading. If you see a pop-up similar to Figure A.6, click OK. Then you should see a screen for selecting packages.
- 7 For our purpose, we only need g++. So enter "g++" in the Search box, click on Skip on the gcc-g++ item to select the g++ package as shown in Figure A.7 and click Next.
- 8 If a screen similar to Figure A.8 shows up for *Resolving Dependencies*, click Next and the progress indicator screen similar to Figure A.9 should appear. It may take several minutes for this step to complete.
- 9 At last, a screen similar to Figure A.10 should show up. Make sure both check boxes are checked and click Finish.

- 10 Verify that you have a "Cygwin Terminal" icon created on your Desktop, as shown in Figure A.11. Double-click on it and a Cygwin command-line prompt should appear. Try the "*pwd*" and "g++ -v" commands as shown in Figure A.12 to make sure your Cygwin setup works.
- 11 Now create a "workspace" folder in the root directory as shown in Figure A.13. This would be the Eclipse workspace for hosting all our C++ projects.

Next, install the Eclipse C/C++ IDE as described in the next section.

E Cygwin Setup	e publisher of this suprem couldn't be	
	Cygwin Net Release Setu	ıp Program
	This setup program is used for the initial Cygwin environment as well as all subser sure to remember where you saved it.	installation of the quent updates. Make
	The pages that follow will guide you thro Please note that Cygwin consists of a la packages spanning a wide variety of pur a base set of packages by default. You program at any time in the future to add, packages as necessary.	ugh the installation. rge number of poses. We only install can always run this remove, or upgrade
	Setup exe version 2 774	
	Copyright 2000-2012	
	http://www.cygwin.com/	
-		
	< Back	Next > Cancel

Figure A.1 Cygwin setup



Figure A.2 Cygwin setup – choose installation type

Select Root Install Select the director installation parar	Directory ory where you want to install Cygwi neters.	in. Also choose a few	E
Root Directory			
C:\mspc\cygwin			Browse
Install For			
All Users (RECC)	MMENDED)		
Cygwin will be a	vailable to all users of the system	L	
🔘 Just Me			
Cygwin will still important Instal lack Administra	be available to all users, but Desk er information are only available t tor privileges or if you have specit	top Icons, Cygwin Menu Entries, o the current user. Only select th ic needs.	and is if you
		< Back Next	> Cancel

Figure A.3 Cygwin setup – Select Root Directory

Cygwin Setu	up - Select Connection Type	
Select Your Setup ne appropria	Internet Connection eeds to know how you want it to connect to the internet. Choose the ate settings below.	E
	Direct Connection Use Internet Explorer Proxy Settings Use HTTP/FTP Proxy:	
	Proxy Host Port 80	
	< Back Next >	Cancel

Figure A.4 Cygwin setup – Select Connection Type



Figure A.5 Cygwin setup – Choose Download Site(s) (if no download sites show up, manually enter <u>http://cygwin.mirrors.hoobly.com</u> in the User URL text box and click Add)

Cygwin Setup		X
Progress This page displays the progress of the download or installation.	E	
Parsing http://cygwin.mirrors.hoobly.com//setup.bz2 100 % (2129k/2129k) Package: Setup Alert)	
This is the first time you've installed Cygwin 1.7.x. Please be advised that this is a major release. If you have not done so already, please check out the documentation at http://cygwin.com/ to see how the upgrade could potentially affect any existing Cygwin installation.	Canc	el
OK Cancel		

Figure A.6 Cygwin setup – Progress

Select Pack Select pa	a ges ackages to install				
Search g++	Clear]			
Category	New	В	S	Size	Package
🗆 All 📀 Defa	ault				
🗉 Devel 🕄	Default				
	🚯 Skip	n/a	n/a	9,620k	cygwin64-gcc-g++: GCC for Cygwin 64bit toolchain (C++)
	0 4.7.3-1	\boxtimes		8,430k	gcc-g++: GNU Compiler Collection (C++)
	Skip	n/a	n/a	11,776k	mingw-gcc-g++: GNU Compiler Collection (C++)
	🚯 Skip	nja	n/a	8,528k	mingw64-i686-gcc-g++: GNU Compiler Collection (C++)
	⊖ Skin	pla	n/o	9134k	mingw64-x86_64-acc-a++; GNU Compiler Collection (C+

Figure A.7 Cygwin setup – Select Packages

The follo	vependencies wing packages are required to satisfy dependencies.	
vinutils	(2.23.51-1) The GNU assembler, linker and binary utilities Required by: gcc-core	•
cygwin64	(1.7.19-8) Cygwin 64bit toolchain Required by: cygwin64-gcc-core	
ygwin64-	binutils (2.23.52-4) Binutils for Cygwin 64bit toolchain Required by: cygwin64-gcc-core	-
•	III	•
Select red	quired packages (RECOMMENDED)	

Figure A.8 Cygwin setup – Resolving Dependencies

22% - Cygwin Setup				_ 🗆 🗙
Progress This page displays the p	rogress of the downloa	ad or installation.		E
Downloading cygwin-1.7.21-1. 1 % (49k/2765k Package: Total: Disk:	tar.bz2 from http://cygv) 58.3 kB/s	win.mirrors.hoobly.cor	n//re	
		< Back	Next >	Cancel

Figure A.9 Cygwin setup – downloading and installing

Cygwin Setup - Installation Status and Create Icons
Create Icons Tell setup if you want it to create a few icons for convenient access to the Cygwin environment.
 ✓ Create icon on Desktop ✓ Add icon to Start Menu
Installation Status Installation Complete
< Back Finish Cancel

Figure A.10 Cygwin setup - Create Icons



Figure A.11 Cygwin setup - Cygwin Terminal icon on the Desktop



Figure A.12 Cygwin setup – verifying the installation (you can also run "cygcheck –c" to list all packages installed)

	· OS (C:) ▶ mspc ▶ cygwin ▶	
Organize 🔻 [Open	Include in library	th ▼ Burn New folder
⊿ 🚖 Favorites	Name	Date modified
🔲 Desktop	👢 bin	7/17/2013 10:20 PM
🗼 Downloads	👢 dev	7/17/2013 10:20 PM
laces 😓 Recent Places	👢 etc	7/17/2013 10:20 PM
	📕 👠 home	7/17/2013 10:23 PM
4 🞇 Libraries	📜 👢 lib	7/17/2013 10:20 PM
Documents	= 👢 mycpp	7/21/2013 9:49 AM
🛛 🕹 Music	📜 👢 test	7/17/2013 10:49 PM
Pictures	📜 👢 tmp	7/21/2013 2:18 PM
🛛 💐 Videos	👢 usr	7/17/2013 10:20 PM
	📜 📜 var	7/17/2013 10:20 PM
🛛 🖓 Homegroup	👃 workspace	7/21/2013 2:12 PM
	Cygwin.bat	7/17/2013 10:22 PM
🛛 🖉 win-i7d1	E Cygwin.ico	7/17/2013 10:22 PM
4 💵 OS (C:)	Cygwin-Termina	I.ico 7/17/2013 10:22 PM

Figure A.13 Cygwin setup – root directory containing the *workspace* directory for Eclipse

A.2 INSTALLING ECLIPSE CDT

Following the below steps to install Eclipse CDT:

- 1 Visit <u>http://www.eclipse.org/cdt</u> and you should see an area similar to Figure A.14 showing the latest version.
- 2 Click on the Download link and you should see an area similar to Figure A.15. Click on the link for the Eclipse package and you should see download links similar to Figure A.16.
- 3 Now choose the proper platform (I chose Windows 64-bit for my 64-bit Windows 7 PC). Then you should see the download link similar to Figure A.17. Click the download link and it should start downloading.
- 4 After downloading is complete, you should see the downloaded zip file (in my case, it was *eclipse-cpp-kepler-R-win32-x86_64.zip*).
- 5 Now unzip this file to a directory on your PC (you may want to rename the unzipped eclipse folder to something like *eclipse_cdt_kepler* as in my case if you have multiple versions of Eclipse installed (or to be installed) on your PC).

In the next section, we describe how to configure your Eclipse C/C++ IDE with g++ you installed in the previous step.

CDT 8.2 Now Available

June 26, 2013 - CDT 8.2 for Eclipse Kepler. Check the **Download** link on how to get yours.

Figure A.14 Eclipse CDT setup – Download link

CDT 8.2.0 for Eclipse Kepler

Eclipse package: Eclipse C/C++ IDE for Kepler.

Figure A.15 Eclipse CDT setup – Choose the current version

Download Links
Windows 32-bit
Windows 64-bit
Mac OS X(Cocoa 32)
Mac OS X(Cocoa 64)
Linux 32-bit
Linux 64-bit
Downloaded 79,812 Times
Checksums

Figure A.16 Eclipse CDT setup – Choose the right platform



Figure A.17 Eclipse CDT setup – Mirror Selection

A.3 CONFIGURING ECLIPSE CDT WITH G++

Follow the below steps to configure your Eclipse CDT IDE to work with g++:

- 1 Locate the *eclipse.exe* file in your eclipse installation folder and double-click on it to bring it up. If you see a pop-up as shown in Figure A.18, you need to drop an existing Java run-time "jre" folder on your PC into the eclipse folder (or install a new one if you don't have one), and then restart it. You should have no trouble to bring it up at this point.
- 2 When you start up eclipse the first time, you will see a screen as shown in Figure A.19. Enter the workspace you created in the root directory of your Cygwin install and click OK. Now close the Welcome page and you should see the normal eclipse workspace.
- 3 Add the Cygwin bin folder to the PATH environment variable as shown in Figure A.20.
- 4 Create a new C++ project by clicking File \rightarrow New \rightarrow C++ Project. Enter "Test" as the project name and make sure you select "Empty Project" under Executable for the project type and "Cygwin GCC" as the Toolchain as shown in Figure A.21. Click Next and you should see a screen similar to Figure A.22. Click Finish and you should see your eclipse IDE as shown in Figure A.23. At this point, you should see no red marks on the Test project you created and under the Problems tab. This confirms that your Eclipse IDE has been configured properly to work with g++.
- 5 Now, create a HelloWorld C++ program as shown in Figure A.24 by clicking File \rightarrow New \rightarrow Source File and name it *hello.cpp*.
- 6 Enter the code as shown in Figure A.25 into the hello.cpp program. If you see red marks appearing in the code area, wait until the Cygwin environment is detected and all red marks should go away.
- 7 Start up a Cygwin Terminal session using the Cygwin Terminal icon on your DeskTop. Change to the /workspace/Test folder. Issue the "g++ -o a.out *.cpp" and "./a.out" commands, and you should see the output as shown in Figure A.26.

This concludes our setting up Eclipse C/C++ IDE with g++ on Windows. We are now ready to try more C++ programs.



Figure A.18 Starting up Eclipse CDT – missing JRE



Figure A.19 Starting up Eclipse CDT- setting workspace

variable	Value
TEMP	%USERPROFILE%\AppData\Local\Temp
ТМР	%USERPROFILE%\AppData\Local\Temp
vstem variables	New Edit Delete
ystem variables Variable	New Edit Delete
ystem variables Variable OS	New Edit Delete
rstem variables Variable OS Path	New Edit Delete Value Windows_NT c:\mspc\cygwin\bin;c:\mspc\myapp\ap
rstem variables Variable OS Path PATHEXT	New Edit Delete Value Value Windows_NT c:\mspc\cygwin\bin;c:\mspc\myapp\ap .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;
rstem variables Variable OS Path PATHEXT Platform	New Edit Delete Value Value Windows_NT c:\mspc\cygwin\bin;c:\mspc\myapp\ap .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS; BPC
ystem variables Variable OS Path PATHEXT Platform	New Edit Delete Value Value Windows_NT c:\mspc\cygwin\bin;c:\mspc\myapp\ap .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS; BPC

Figure A.20 Configuring Eclipse CDT- setting PATH environment variable for Cygwin g++

C++ Project	
C++ Project Directory with specified name already exists. 	
Project name: Test Vuse default location Location: C:\mspc\cygwin\mycpp\Test Choose file system: default	Browse
Project type: Cygwin GCC Empty Project Hello World C++ Autotools P Executable Empty Project Hello World C++ Project Show project types and toolchains only if they are supported	d on the platform
? < Back Next > Finish	Cancel

Figure A.21 Creating a Test C++ project – choose Toolchains (unselect the check box preceding *Show project types and tool chains* ... if you don't see Cygwin GCC listed under Toolchains)

C++ Project					
Select Configurations Select platforms and configurations you wish to deploy on					
Project type: Executable Toolchains: Cygwin GCC Configurations:					
♥ ⓑ Debug ♥ ⓑ Release	Select all Deselect all				
Advanced settings" Use "Advanced settings" button to edit project's properties. Additional configurations can be added after project creation. Use "Manage configurations" buttons either on toolbar or on property pages.					
C Sack Next > Finish	Cancel				

Figure A.22 Creating a Test C++ project – Select Configurations



Figure A.23 An empty C++ project (note the entries under *Include*)

New Source	File	
Source File Create a new	source file.	C
Source folder: Source file:	Test hello.cpp	Browse
Template:	Default C++ source template	Configure
?	Finish	Cancel

Figure A.24 Configuring Eclipse CDT – creating a HelloWorld C++ program



Figure A.25 Configuring Eclipse CDT– the HelloWorld program



Figure A.26 Configuring Eclipse CDT- compiling and running the test program

If you see errors as shown in Figure A.27, check which builder you are using against Figure 2.28 and make sure you choose Eclipse built-in builder. You may also need to add make and cmake packages by clicking the Cygwin's setup.exe file and going through a similar process to add these packages. If you build your project using Eclipse's "Build Project" feature, you may end up with a <project_name>.exe file, which can only be executed by entering "./<your>.exe" at the Cygwin command project. This may not work when you have multiple standalone programs in your project, which is why I suggest you compile your program at the Cygwin command prompt using g++.



Figure A.27 Configuring Eclipse CDT- error of Program "make" not found in PATH

type filter text	Tool Chain Editor	• •		
 Resource Builders C/C++ Build Build Variables 	Configuration: Debug [Active]	onfigu		
Logging	✓ Display compatible toolchains only			
Settings	Current toolchain: Cygwin GCC			
 C/C++ General Project References Run/Debug Settings Task Repository 	Current builder: org.eclipse.linuxtools.cdt.autotools.core.toolchain.build	der		
WikiText	GCC Assembler	elect T		
	Restore Defaults	Ap •		
(?)	OK Cancel			

Figure A.28 Configuring Eclipse CDT- Select eclipse built-in builder

Finally, if you want to turn on the "Show line numbers" feature on the Eclipse IDE, see Figure A.29.

Preferences		
type filter text	Text Editors See <u>'Colors and Fonts'</u> to configure the font.	
 General Appearance 		
Compare/Patch	Undo history size:	200
✓ Editors	Displayed tab width:	4
File Associations	Insert spaces for tabs	
Text Editors	Highlight current line	
Accessibility	Show print margin	
Annotations	Print margin column:	80
Hyperlinking	Show line numbers	
Ouick Diff	 Show range indicator Show whitespace characters (configure visibility) Show affordance in hover on how to make it sticky 	
Spelling		
> WikiText		

Figure A.29 Turning on the Show line numbers feature on Eclipse