Installing Photran with Eclipse (MinGW or Cygwin)

Photran is an integrated development environment (IDE) and refactoring tool for Fortran. Photran is a component of Eclipse, an open-source development platform for building, deploying and managing software. Together, they provide a free interface for creating and compiling Fortran projects.

This document provides instructions for installing Photran and Eclipse on the Microsoft Windows operating system.

The sections of this document include:

- Installing Java
- Installing the compiler
- <u>Updating the "PATH" system variable</u>
- Installing Photran and Eclipse
- <u>Running Eclipse for the first time</u>
- Updating Photran and Eclipse

Notes:

- These steps were performed on a 64-bit machine, although 32-bit versions of the software and compiler were used with the intent to compile a 32-bit binary of standalone MESH.
- An internet connection is required to download and install the software and compiler.
- An account with administrative privileges is required to install the software and compiler.

Installing Java

Java is required to install Eclipse.

- Run the 'Windows Offline (32-bit)' installation file:
 - o Java Downloads for All Operating Systems: <u>http://java.com/en/download/manual.jsp</u>
 - The installation file has a "*.com" extension, but can still be run from Internet Explorer.
 - "jre-7u51-windows-i586.com" (32-bit, approx. 28MB) was the name of the installation file for 'Java Version 7, Update 51' at the time of writing.

Installing the compiler

The GNU gfortran compiler is used to compile Fortran projects. Two distributions of the compiler exist: MinGW and Cygwin; only ONE of the two distributions has to be installed.

• Do not install MinGW if you intend to install Cygwin. Likewise, do not install Cygwin if you intend to install MinGW.

To install MinGW:

- Run the 'MinGW Installation Manager':
 - MinGW Minimalist GNU for Windows: <u>http://sourceforge.net/projects/mingw/files/Installer/</u>
 - "mingw-get-setup.exe" (32-bit, less than 1MB) was the name of the installation file for
 'mingw-get version 0.6.2-beta-20131004-1' at the time of writing.
- Click "Install".
- Leave "C:\MinGW" as the "Installation Directory".
- Click "Continue".

| Step 1: Specify Installation Preferences |
|--|
| Installation Directory |
| C:\MinGW Change |
| If you elect to change this, you are advised to avoid any choice of directory which includes white space within the absolute representation of its path name. |
| User Interface Options Both command line and graphical options are available. The command line interface is always supported; the alternative only if you choose the following option to also install support for the graphical user interface. |
| Program shortcuts for launching the graphical user interface should be installed ● just for me (the current user), or ● for all users * ✓ in the start menu, and/or ✓ on the desktop. * selection of this option requires administrative privilege. |
| View Licence Continue Cancel |

• The installation will download a number of files. Click "**Continue**" after the process has completed.

| Download Catalogue | Prog | Iress | | | | | | llation Ma e for erro | 2 | | |
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| Vie | ew Li | icenc | e | | | | Con | itinue | | Quit | |
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- The setup program will launch the "MinGW Installation Manager".
 - Alternatively, launch the program from the Desktop or Start menu.

- Select "**Basic Setup**" in the package list.
- Mark "mingw32-base" and "mingw32-fortran" for installation.
 - Click the box in the column next to the package name.
 - Click "Mark for Installation".
- Click "**Installation**" in the window menu.
- Click "Apply Changes".

| 3 | MinGW Ins | stallatio | on Manager | - | □ × |
|----------------------|------------------------------|-----------|-------------------------|--------------------|--------------|
| Installation Package | <u>S</u> ettings | | | | <u>H</u> elp |
| Basic Setup | Package | Class | Installed Version | Repository Version | Descriptior |
| All Packages | mingw-developer-tool | bin | | 2013072300 | An MSYS I |
| | mingw32-base | bin | 2013072200 | 2013072200 | A Basic Mir |
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| | mingw32-gcc-fortran | bin | 4.8.1-4 | 4.8.1-4 | The GNU F |
| | mingw32-gcc-g++ | bin | | 4.8.1-4 | The GNU C |
| | mingw32-gcc-objc | bin | | 4.8.1-4 | The GNU C |
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| | General Description Depe | ndencie | s Installed Files Ver | rsions | |
| | No package selected. | | | | |
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| | Please select a package from | n the lis | t above, to view relate | ed data. | |
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- Click "Apply". The manager will download and extract files to the MinGW root directory.
 - This process will take a few moments.

| Schedule of Pen | ding Actions |
|--|---------------------|
| Okay to proceed? The package changes itemised below will be implemented when you choose "Apply" | Apply Defer Discard |
| 0 installed packages will be removed | |
| | |
| 0 installed packages will be upgraded | |
| | ^ |
| | ~ |
| 25 new/upgraded packages will be installed | |
| libgmp-5.1.2-1-mingw32-dll-10.tar libmpfr-3.1.2-2-mingw32-dll-4.tar libmpc-1.0.1-2-mingw32-dll-3.tar libquadmath-4.8.1-4-mingw32-dll-0.tar libgomp-4.8.1-4-mingw32-dll-1.tar | |
| libssp-4.8.1-4-mingw32-dll-0.tar | × |

| All changes were applied successfully; you may now close this dialogue. | | | | | |
|--|-------|--|--|--|--|
| Close dialogue automatically, when activity is complete. | Close | | | | |
| Details | | | | | |
| <pre>install: mingwrt-4.0.3-1-mingw32-dev.tar.lzma installing mingwrt-4.0.3-1-mingw32-dev.tar.lzma install: binutils-2.23.2-1-mingw32-bin.tar.lzma install: gcc-core-4.8.1-4-mingw32-duv.tar.lzma installing gcc-core-4.8.1-4-mingw32-dlu-8.tar installing gcb-7.6.1-1-mingw32-bin.tar.lzma install: gbintl-0.18.3.1-1-mingw32-dll-8.tar installing gb-7.6.1-1-mingw32-bin.tar.lzma installing gb-7.6.1-1-mingw32-bin.tar.lzma install: gake-3.82.90-2-mingw32-cvs-20120902-bin.tar.lzma installing gake-3.82.90-2-mingw32-cvs-20120902-bin.tar.lzma installing gcc-core-4.8.1-4-mingw32-lic.tar.lzma installing gcc-core-4.8.1-4-mingw32-bin.tar.lzma installing gcc-fortran-4.8.1-4-mingw32-dll-3.tar installing gcc-fortran-4.8.1-4-mingw32-dll-3.tar installing gcc-fortran-4.8.1-4-mingw32-dv.tar.lzma installing gcc-fortran-4.8.1-4-mingw32-dv.tar.lzma installing gcc-fortran-4.8.1-4-mingw32-dv.tar.lzma installing gcc-fortran-4.8.1-4-mingw32-dv.tar.lzma installing gcc-fortran-4.8.1-4-mingw32-dv.tar.lzma</pre> | ^ | | | | |

- Click "**Close**" after the process has completed.
- Click "**Installation**" in the window menu.
- Click "**Quit**" to close the installation manager.

Do not install Cygwin if MinGW was just installed.

To install Cygwin:

- Run 'Cygwin Net Release Setup Program':
 - o Installing and Updating Cygwin Packages: <u>http://cygwin.com/install.html</u>
 - "setup-x86.exe" (32-bit, less than 1MB) was the name of the installation file for
 'Setup.exe version 2.844 (32 bit)' at the time of writing.
- Click "Next".

| E | Cygwin Setup | - | | × |
|---|--|---|-----|-----|
| | Cygwin Net Release Setup Program This setup program is used for the initial installation of Cygwin environment as well as all subsequent updat sure to remember where you saved it. The pages that follow will guide you through the inst. Please note that Cygwin consists of a large number of packages spanning a wide variety of purposes. We install a base set of packages by default. You can a this program at any time in the future to add, remove upgrade packages as necessary. | f the es. Ma allation of only always | 1. | |
| | Setup.exe version 2.844 (32 bit) Copyright 2000-2013 http://www.cyawin.com/ < Back Next > | | Can | cel |

- Select "Install from Internet".
- Click "**Next**".

| E | Cygwin Setup - Choose Installation Type - | □ × |
|--|--|--------|
| Choose A Downloa Choose whether t a local directory. | to install or download from the internet, or install from files in | E |
| (| Install from Internet (downloaded files will be kept for future re-use) Download Without Installing | |
| | ○ Install from Local Directory | |
| | < <u>B</u> ack <u>Next</u> > | Cancel |

- Leave "C:\Cygwin" as the "Root Directory".
- Click "**Next**".

| parameters. | | | | |
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| (RECOMMENDED |)) | | | |
| vill be available to a | all users of the sys | stem. | | |
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| nformation are only | available to the o | current user. Only | | |
| i i | will be available to a will still be available information are only | (RECOMMENDED) will be available to all users of the sys will still be available to all users, but D information are only available to the o | (RECOMMENDED) will be available to all users of the system. will still be available to all users, but Desktop Icons, Cy | (RECOMMENDED) will be available to all users of the system. will still be available to all users, but Desktop Icons, Cygwin Menu Entries information are only available to the current user. Only select this if you la |

- The "Local Package Directory" is where temporary installation files are stored. By default, the installation will create a subdirectory within the directory containing the installation file.
- Click "Next".

| Cygwin Setup - Select Local Package Directory | - 🗆 🗙 |
|--|--------|
| Select Local Package Directory Select a directory where you want Setup to store the installation files it downloads. The directory will be created if it does not already exist. | E |
| Local Package Directory | |
| C:\Cygwin\source | Browse |
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| | |
| | |
| < <u>B</u> ack <u>N</u> ext > | Cancel |
| | |

- Select "Direct Connection".
 - Alternatively, select "**Use HTTP/FTP Proxy**" and enter additional information if required.
- Click "**Next**".

| E | Cygwin Setup - Select Connection Type 🛛 – 🗖 🗙 |
|-------------|---|
| Setup needs | nternet Connection s to know how you want it to connect to the internet. Choose ate settings below. |
| | <u>D</u> irect Connection Use Internet Explorer Proxy Settings Use HTTP/FTP Proxy: |
| | Proxy Host Port 80 |
| | |
| | < <u>B</u> ack <u>N</u> ext > Cancel |

- Select any one of the download sites from the "Available Download Sites" list.
 - The list of sites changes from time to time; any one of the sites suggested by the installation can be used.
- Click "Next".

| | Cygwin Setup - Choose Dow | /nload Site(s) – 🗆 | |
|----------------------------|---|--------------------------|----|
| Choose A Do Choose a si | wnload Site te from this list, or add your own sites to the list | | |
| | Available Download Sites: | | |
| | http://cygwin.skazkaforyou.com http://miror.symnds.com http://miror.weathercity.com ftp://ftp.gtilb.gatech.edu http://www.gtilb.gatech.edu http://miror.cs.vt.edu http://miror.cs.vt.edu http://miror.mcs.anl.gov http://miror.mcs.anl.gov http://miror.nexcess.net ftp://miror.nexcess.net | | |
| User URL: | | Add | |
| | < | Back <u>N</u> ext > Canc | el |

• The installation will download a number of files.

- The installation window will maximize after downloading has completed. A number of Cygwin packages are available to install. Expand the "**Devel**" branch.
- Mark the following packages for installation: "gcc-fortran", "gbd" and "make".
 - Additional packages may have been selected by the installation.
 - Click on the line where it says 'Skip' to mark the package for installation; once marked, the line will show a version number instead of 'Skip'.
- Click "Next".

| <u>S</u> earch | Clear | | | ◯ <u>K</u> eep (| ● <u>C</u> urr ○ Exp <u>V</u> iew Category |
|----------------|-----------|-------------|-----|------------------|---|
| Current | New | B | S | Size | Package |
| | Skip | ηία | n/a | 115k | flac-devel: Free Lossless Audio Codec (|
| | 😯 Skip | n/a | n/a | 241k | flex: A fast lexical analyzer generator |
| | 😯 Skip | n/a | n/a | 155k | flexdll: Creates DLLs with runtime symbo |
| | 😯 Skip | n/a | n/a | 661k | fossil: DVCS with built-in wiki, http serve |
| | 😯 Skip | n/a | n/a | 11,837k | gcc-ada: GNU Compiler Collection (Ada |
| 4.8.2-2 | 😯 Кеер | n/a | | 12,983k | gcc-core: GNU Compiler Collection (C, (|
| 4.8.2-2 | 0 4.8.2 1 | \boxtimes | | 5,020k | gcc-fortran: GNU Compiler Collection (F |
| | 😯 Skip | n/a | nja | 6,872k | gcc-g++: GNU Compiler Collection (C++ |
| | 😯 Skip | n/a | nja | 17,319k | gcc-java: GNU Compiler Collection (Jav |
| | 😯 Skip | n/a | nja | 3,872k | gcc-objc: GNU Compiler Collection (Obj |
| | 😯 Skip | n/a | nja | 4,066k | gcc-objc++: GNU Compiler Collection (C |
| | 😯 Skip | n/a | nja | 425k | gcc-tools-epoch1-autoconf: (gcc-specia, |
| < | | | | | > |

- The installation will download and extract packages to the Cygwin root directory.
 - This process will take a few moments.
- Click "Finish".

Updating the "PATH" system variable

Once installed, the root directory of either MinGW or Cygwin must be added to the "PATH" system variable. This variable permits Eclipse to access the compiler and other components included in the distribution.

- Search and click "Edit the system environment variables" in the Start menu, or:
 - From Windows Explorer, open "Control Panel".
 - Click "System and Security" or "Performance and Maintenance".
 - Click "**System**".
 - Click "Advanced system settings" to open the "System Properties" window.
- Click the "**Advanced**" tab.
- Click "Environment Variables...".

| | 5 | System Pro | operties | | × |
|----------------|---------------|----------------|-----------------------|-------------------|----|
| Computer Name | Hardware | Advanced | System Protection | Remote | |
| You must be lo | gged on as | an Administrat | tor to make most of t | hese change | s. |
| Performance | | | | | |
| Visual effects | processor s | cheduling, m | emory usage, and vir | tual memory | |
| | | | | - | 1 |
| | | | | Settings | |
| User Profiles | | | | | |
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| | | | | S <u>e</u> ttings | |
| Startup and R | ecoverv | | | | |
| | | lure, and deb | ugging information | | |
| | | | | | |
| | | | | Settings | |
| | | | | | |
| | | | Enviro <u>n</u> me | ent Variables. |) |
| | | | | | |
| | | ОК | Cancel | App | h. |
| | | UK | Cancel | Арр | iy |

- Select the "Path" variable in the "System variables" group
- Click "**Edit…**".

| Variable | Value | |
|---------------------------------------|--|------|
| TEMP | %USERPROFILE%\AppData\Local\Temp | |
| TMP | %USERPROFILE%\AppData\Local\Temp | |
| | | |
| | New Edit Delet | te |
| | | |
| ystem variables Variable | New Edit Dele | te / |
| Variable NUMBER_OF_P | Value | |
| Variable NUMBER_OF_P OS | Value 4 Windows_NT | - |
| Variable NUMBER_OF_P OS Path | Value 4 Windows_NT C:\Windows\system32;C:\Windows;C:\ | |
| | Value 4 Windows_NT | |

- Append the root directory of the appropriate distribution to the "**Variable value**". A semicolon is used to separate individual directories.
 - For MinGW:
 - For Cygwin:
- Click "**OK**" to save and apply the change in each window.

| E | dit System Variable |
|---|---|
| Variable <u>n</u> ame: Variable <u>v</u> alue: | Path server\110\Tools\Binn\;C:\MinGW\bin}C:\Prc OK Cancel |

Installing Photran and Eclipse

Once Java and either MinGW or Cygwin have been installed, Eclipse can be installed to the system. Eclipse is distributed as an archive.

- Download 'Eclipse for Parallel Application Developers':
 - Eclipse for Parallel Application Developers: <u>http://eclipse.org/downloads/packages/eclipse-parallel-application-developers/keplersr1</u>
 - This distribution of Eclipse includes Photran. Alternatively, Photran can also be installed to an existing configuration of Eclipse. See the 'Photran 8.0 Installation Guide' for more information: <u>http://wiki.eclipse.org/PTP/photran/documentation/photran8installation</u>.
 - o "eclipse-parallel-kepler-SR1-win32.zip" (32-bit, approx.. 212MB) was used at the time of writing.
- Extract the archive to a directory (e.g., "C:\Eclipse").

Running Eclipse for the first time

Eclipse does not automatically add shortcuts to your Start menu, Desktop or Taskbar. You may wish to create a shortcut to the executable, which can be copied to the Desktop for future reference.

- Right-click on "eclipse.exe".
- Click "Create shortcut".

To run Eclipse:

• Double-click "eclipse.exe".

While the Eclipse splash screen is displayed, the "**Workspace Launcher**" window will open. The workspace acts as a centralized location where future projects can be saved. By default, a subdirectory in the User directory is recommended.

• Check "Use this as the default and do not ask again".

Eclipse will load.

- Once the Eclipse IDE has opened, the "**Welcome**" page is shown. Click the 'X' in the "**Welcome**" tab to close the page.
- The default 'C/C++' perspective will load.
 - A perspective is a pre-assembled arrangement of common windows and panes that are typically suited to a particular development environment.
- Click "**Window**" in the window menu.
- Click "Open Perspective".
- Click "**Other...**". A new window will open.
- Select "**Fortran**" in the list.
- Click "**OK**". The Fortran perspective will load.

Updating Photran and Eclipse

The debug option was temporarily removed in Photran 8, and may have been omitted in the online installation distribution. Update the software to re-enable the debug option.

- Click "**Help**" in the window menu.
- Click "Check for Updates".
 - Photran 8.0.4.201302122310 was used at the time of writing.

| Name | | Version | ld |
|------------------------|---|---------------------|------|
| 🔺 🚯 Eclipse fo | r Parallel Application Developers | 1.5.2.20130214-1214 | epp |
| b Sclips | e Platform | 4.2.2.M20130204-12 | org. |
| > 🚯 EPP P | arallel Feature | 1.5.2.20130214-1214 | org. |
| 🕟 🖗 IBM X | (L Fortran Compiler Support | 8.0.4.201302122310 | org. |
| a 🖗 Linux | Intel(R) Fortran Compiler Support | 8.0.4.201302122310 | org. |
| <u> </u> | atom Development Tele (Dhistory) | 8.0.4.201302122310 | org. |
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