

# NM180100 Software Development Toolchain Setup

# 1. Contents

1. Contents .....	2
2. Toolchain Installation Steps.....	3
2.1. Linux .....	3
2.1.1. Pre-requisite .....	3
2.1.2. Java Development Kit .....	3
2.1.3. SEGGER J-Link Installation .....	3
2.1.4. GNU ARM Embedded Toolchain Installation.....	6
2.1.5. Eclipse Installation .....	7
2.2. Windows.....	14
2.2.1. Pre-requisite .....	14
2.2.2. Python Installation.....	17
2.2.3. SEGGER J-Link Installation .....	18
2.2.4. GNU ARM Embedded Toolchain Installation.....	19
2.2.5. Executable Search Path .....	19
3. Eclipse Configuration.....	22
3.1. C/C++ Environment Setup .....	22
3.2. Eclipse GNU MCU Configuration .....	24
3.2.1. Global ARM Toolchains Paths Configuration.....	25
3.2.2. Global SEGGER J-Link Path Configuration.....	26
4. Document Details .....	27

## 2. Toolchain Installation Steps

To develop software for the NM180100, you will need to install and setup a toolchain that can build, program, and debug code for the Ambiq Micro Apollo 3 processor in the NM180100. This guide will help you setup the development environment on your system.

### 2.1. Linux

This section assumes that you are running Ubuntu or similar Debian environment.

#### 2.1.1. Pre-requisite

Check if the default development tools are installed. If not, issue the following commands in a terminal:

```
sudo apt-get update
```

```
sudo apt-get upgrade
```

```
sudo apt install build-essential make openocd gdb-multiarch
```

```
sudo apt install python3
```

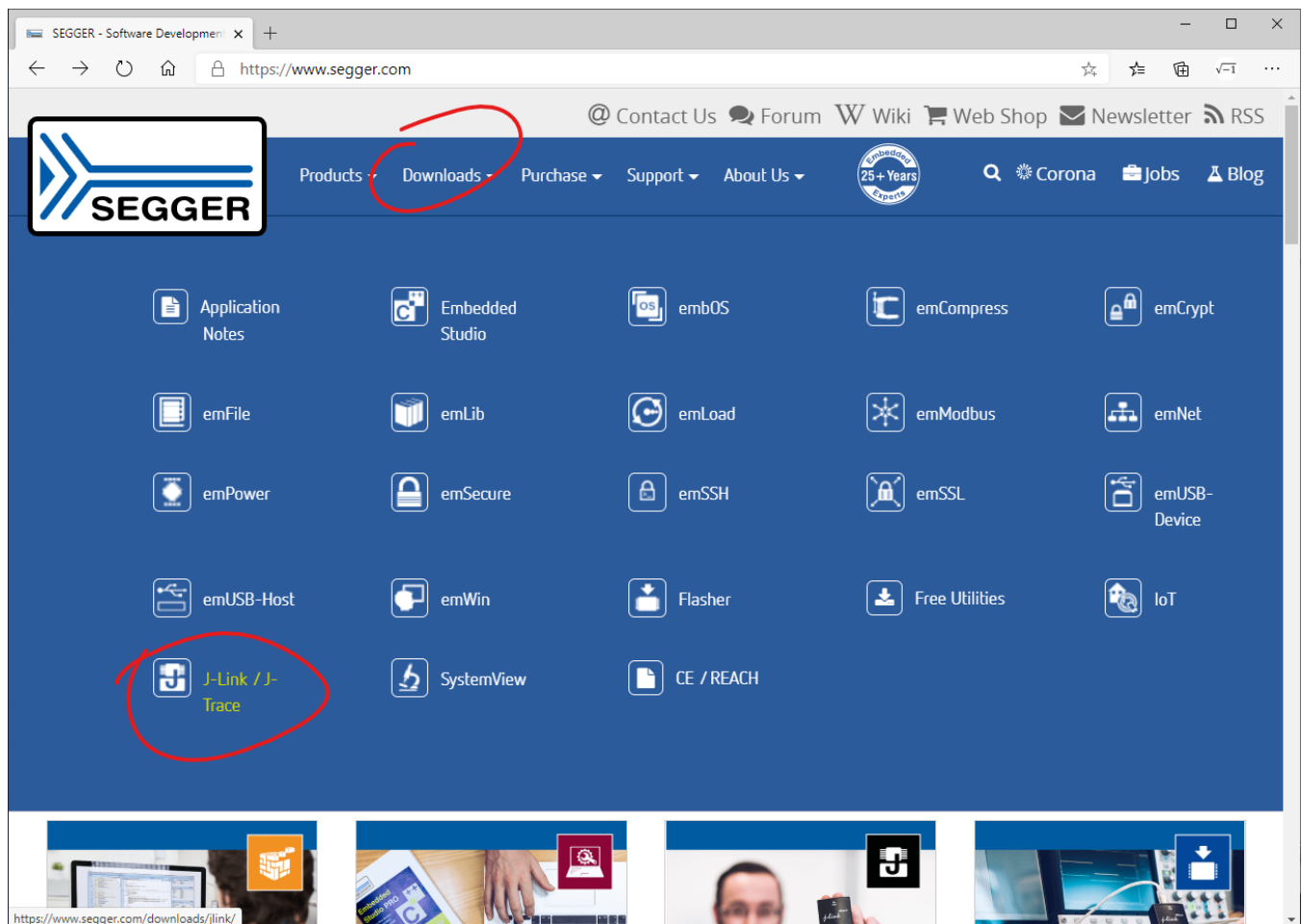
#### 2.1.2. Java Development Kit

This is optional and is only required if you plan on developing with Eclipse.

```
sudo apt install default-jdk
```

#### 2.1.3. SEGGER J-Link Installation

- Visit <https://www.segger.com>
- Select J-Link / J-Trace under Downloads



- Scroll to J-Link Software and Documentation and expand the section by clicking on the + sign.

SEGGER - The Embedded Expert

https://www.segger.com/downloads/jlink/#J-LinkSoftwareAndDocumentationPack

Contact Us Forum Wiki Web Shop Newsletter RSS

Products Downloads Purchase Support About Us

25+ Years

Corona Jobs Blog

Documentation

J-Link Software and Documentation Pack

- All-in-one debugging solution
- Can be downloaded and used free of charge by any owner of a SEGGER **J-Link**, **J-Trace** or **Flasher** model. Not all features of it may be available on all J-Link / J-Trace / Flasher models.
- Updated frequently
- [Release Notes](#)
- [More information](#)

Click for downloads

J-Link Software and Documentation Pack **[Beta version]**

- All-in-one debugging solution
- Can be downloaded and used free of charge by any owner of a SEGGER **J-Link**, **J-Trace** or **Flasher** model.

- Download the appropriate file for your OS. If you are running Ubuntu 64-bit for example, download the Linux, DEB installer, 64-bit.

The screenshot shows the SEGGER website's download page for J-Link software. The page features a navigation bar with the SEGGER logo and various menu items. Below the navigation bar, there is a table listing several software packages. Each row includes a description of the package, a version dropdown menu (all set to V6.80b), a date in brackets (all [2020-06-05]), a file size in KB, and a 'DOWNLOAD' button with a download icon.

Package Name	Version	Date	Size (KB)	Action
J-Link Software and Documentation pack for macOS	V6.80b	[2020-06-05]	34,311	DOWNLOAD
J-Link Software and Documentation pack for Linux, DEB installer, 32-bit	V6.80b	[2020-06-05]	32,637	DOWNLOAD
J-Link Software and Documentation pack for Linux, DEB installer, 64-bit	V6.80b	[2020-06-05]	43,171	DOWNLOAD
J-Link Software and Documentation pack for Linux, RPM installer, 32-bit	V6.80b	[2020-06-05]	32,650	DOWNLOAD
J-Link Software and Documentation pack for Linux, RPM installer, 64-bit	V6.80b	[2020-06-05]	38,365	DOWNLOAD
J-Link Software and Documentation pack for Linux, TGZ archive, 32-bit	V6.80b	[2020-06-05]	32,702	DOWNLOAD
J-Link Software and Documentation pack for Linux, TGZ archive, 64-bit	V6.80b	[2020-06-05]	43,247	DOWNLOAD
J-Link Software and Documentation pack for Linux ARM systems	V6.80b	[2020-06-05]	22,189	DOWNLOAD

- In a terminal, navigate to the directory where you have downloaded the installer and type the following `sudo apt install installer_file_name.deb`

In Ubuntu, this will install JLink under `/opt/SEGGER/JLink`. You can optionally add this directory to your search path so that J-Link is accessible anywhere.

## 2.1.4. GNU ARM Embedded Toolchain Installation

- Visit <https://developer.arm.com/open-source/gnu-toolchain/gnu-rm/downloads>
- Download the corresponding file for your OS.

The screenshot shows the ARM Developer website's download page for the GNU ARM Embedded Toolchain. The page is titled "What's new in 9-2020-q2-update" and lists four download options for the "In this release" section. Each option includes a numbered list item, a link to the download file, a description of the file, and its MD5 hash.

Item	File Name	Description	MD5 Hash
1	<a href="#">gcc-arm-none-eabi-9-2020-q2-update-win32.exe</a>	Windows 32-bit Installer (Signed for Windows 10 and later) (Formerly SHA2 signed binary)	62d2b385da1550d431c9148c6e06bd44
2	<a href="#">gcc-arm-none-eabi-9-2020-q2-update-win32.zip</a>	Windows 32-bit ZIP package	184b3397414485f224e7ba950989aab6
3	<a href="#">gcc-arm-none-eabi-9-2020-q2-update-x86_64-linux.tar.bz2</a>	Linux x86_64 Tarball	2b9eccc33470f9d3cda26983b9d2dc6
4	<a href="#">gcc-arm-none-eabi-9-2020-q2-update-aarch64-linux.tar.bz2</a>	Linux AArch64 Tarball	

- In a terminal, extract the file to a location of your choice. For example, if the file is downloaded to your Downloads directory under your home folder and you want to install the toolchain in /opt, then type the following:

```
cd /opt
```

```
sudo bunzip2 ~/Downloads/gcc-arm-none-eabi-9-2020-q2-update-x86_64-  
linux.tar.bz2
```

### 2.1.5. Eclipse Installation

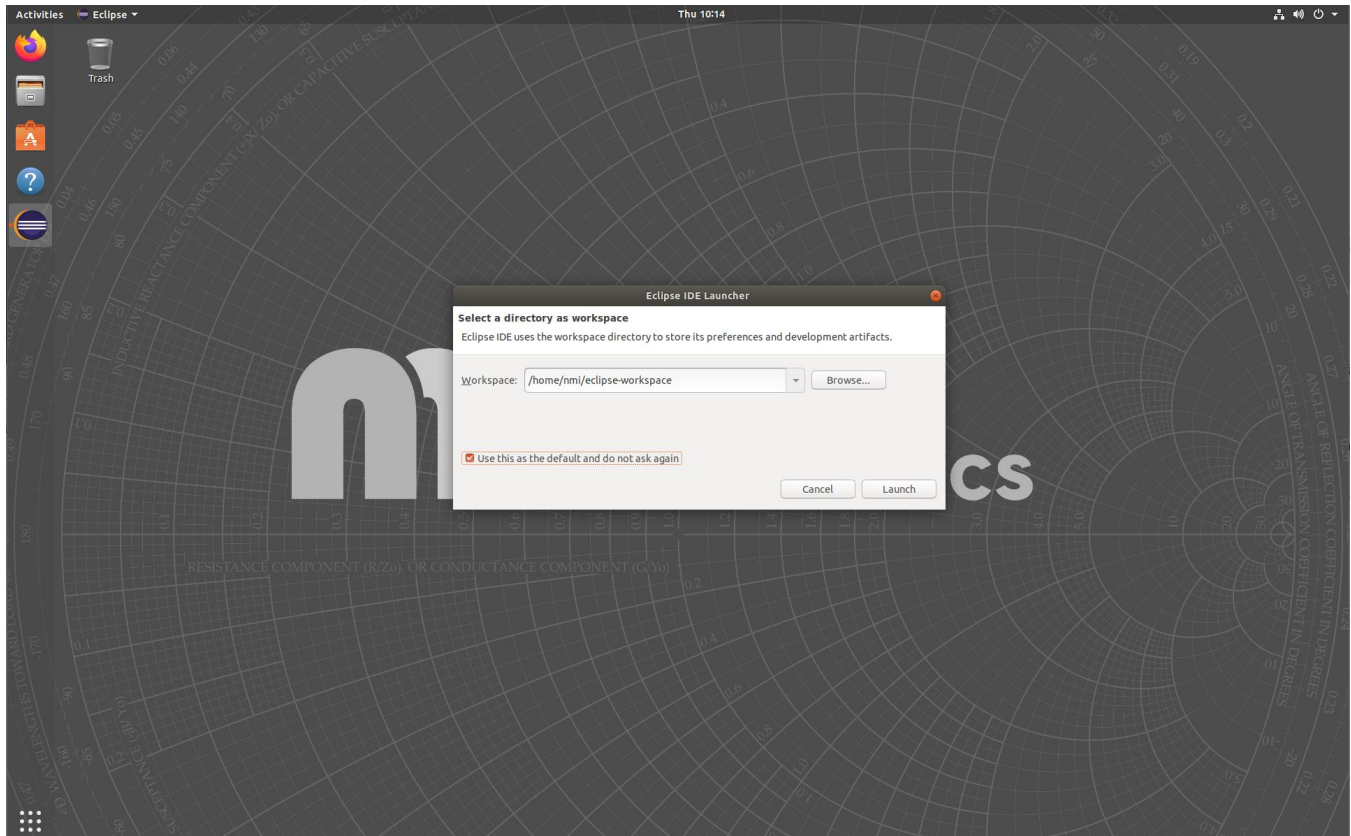
- To install Eclipse, open a terminal and type the following

```
sudo snap install eclipse --classic
```

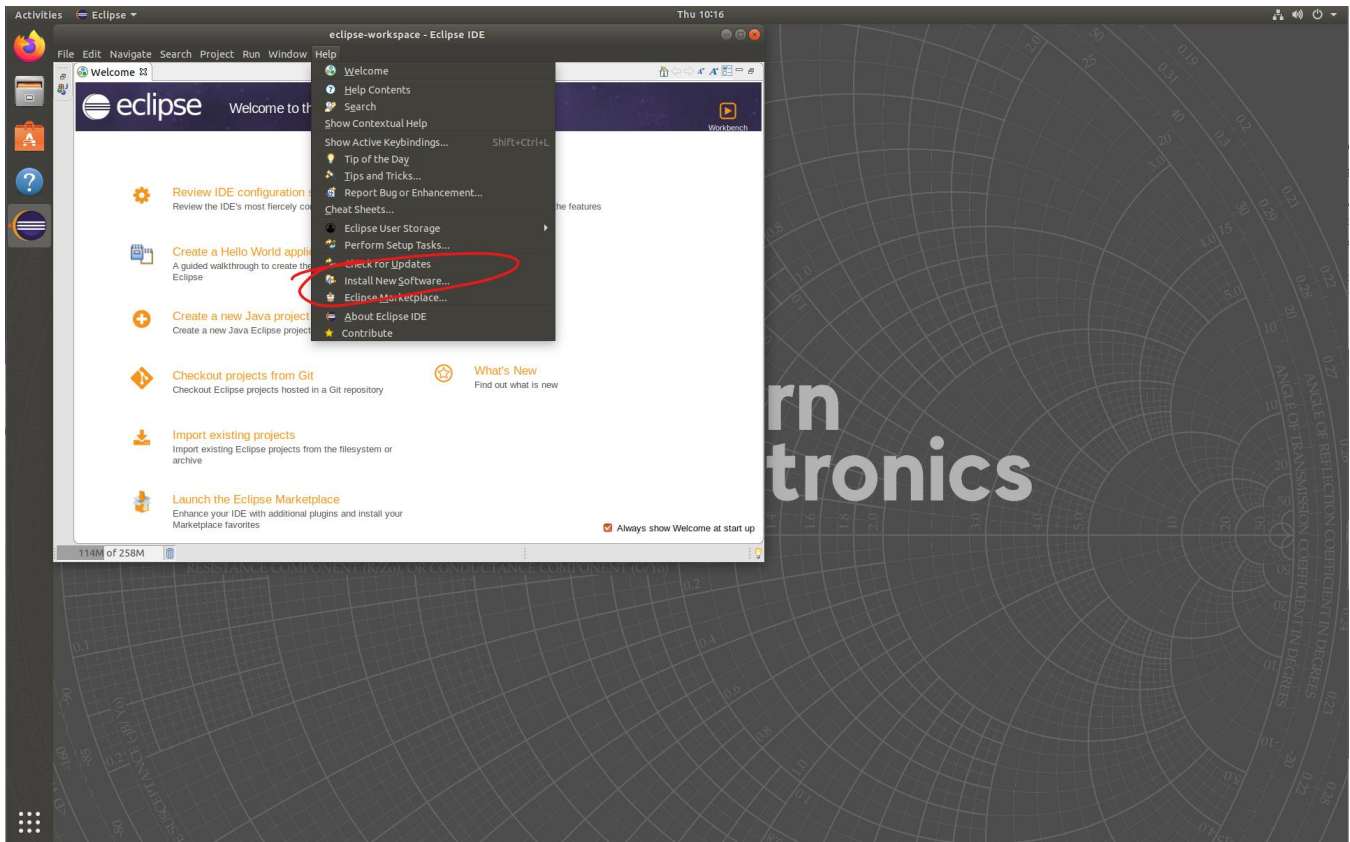
- If you already have Eclipse installed and need to update to the latest version, type the following. Otherwise skip to the next step.

```
sudo snap refresh eclipse
```

- Once Eclipse is installed, start the program. If this is the first time you are running Eclipse, it will ask you for a location for the workspace. Mark the checkbox and select “Launch”

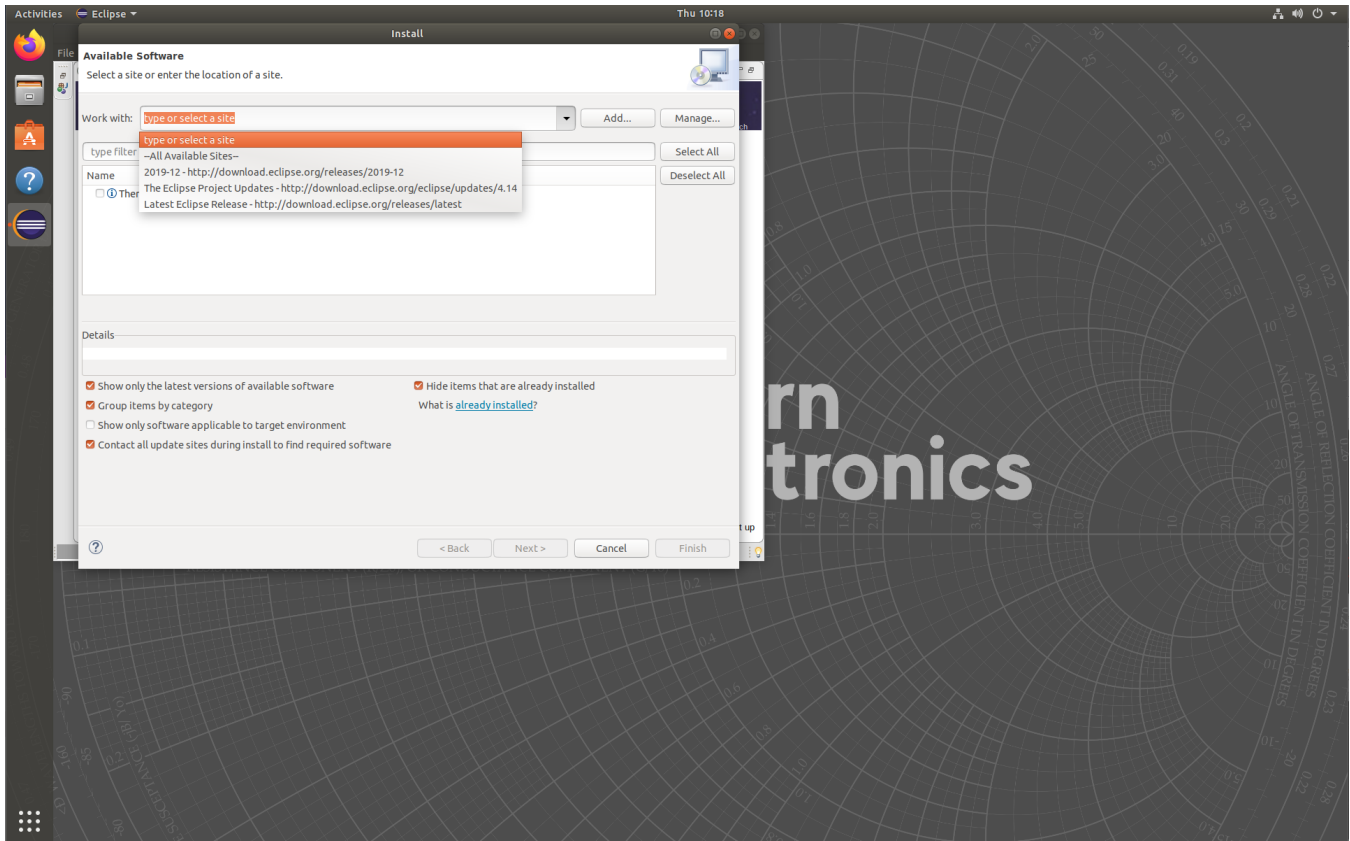


- We will now install the C/C++ Development Tools necessary for firmware development. With Eclipse opened, click “Help” in the menu bar and then select “Install New Software...”

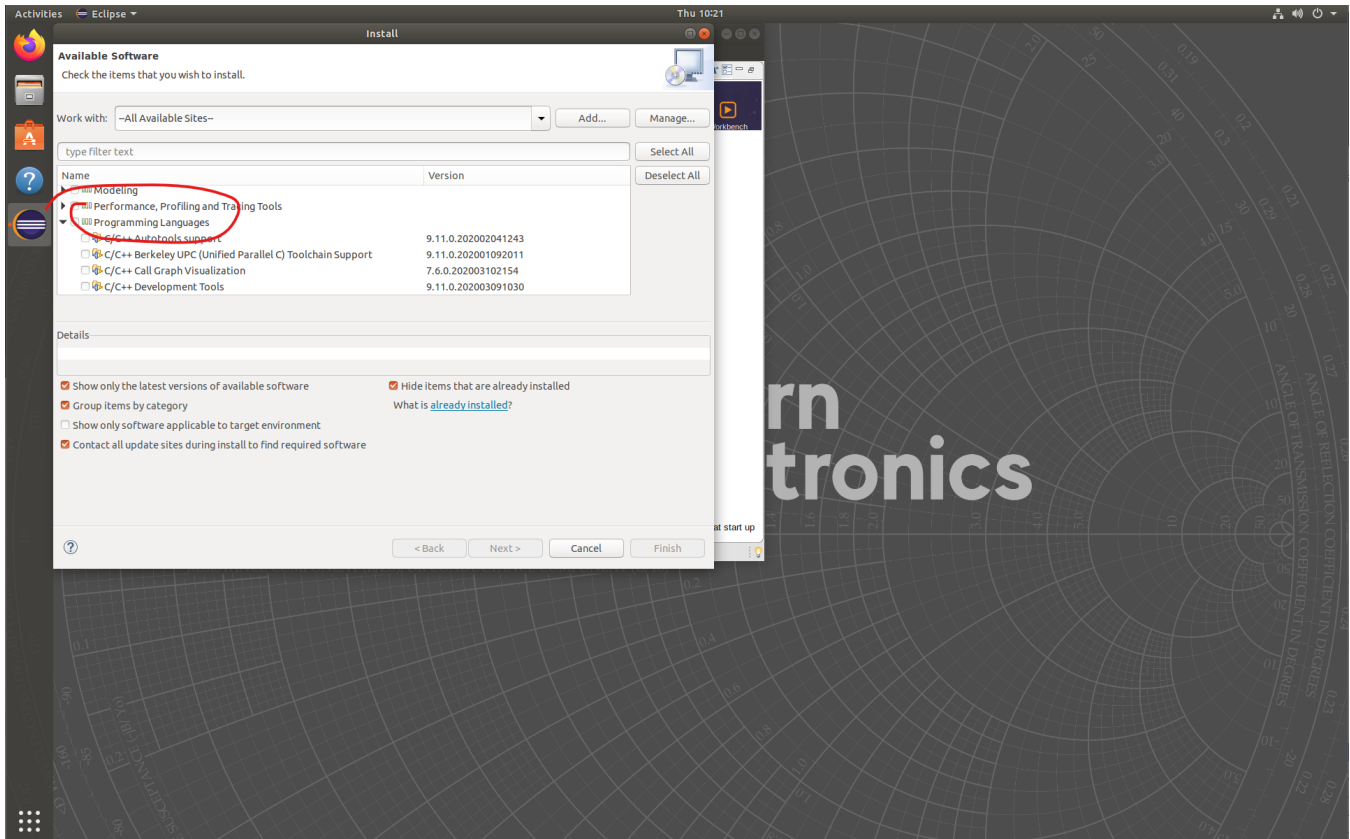




- This will open a new window. Click the “Work with” drop down box and select “—All Available Sites—”

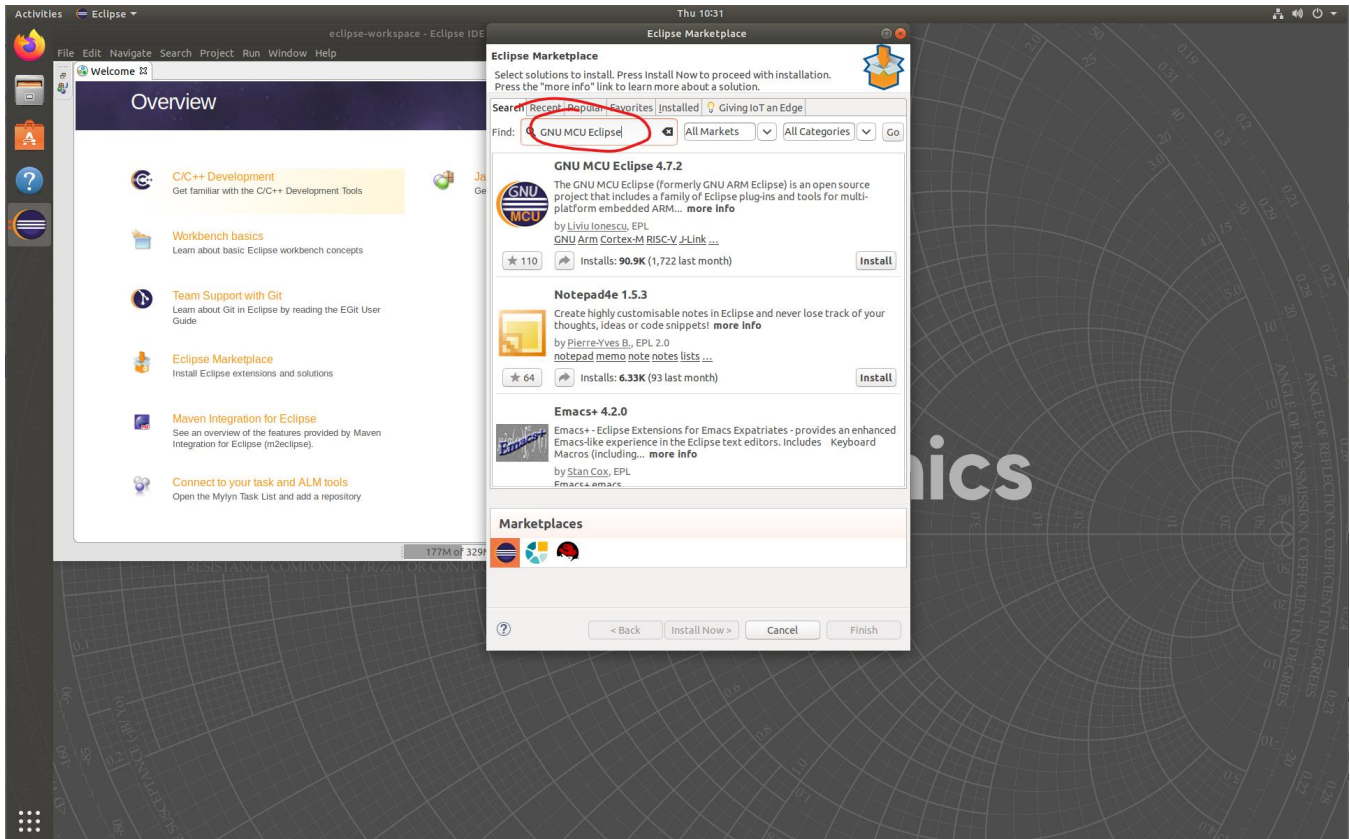


- Once the loading is complete, scroll to the line called “Programming Languages” and expand the item.

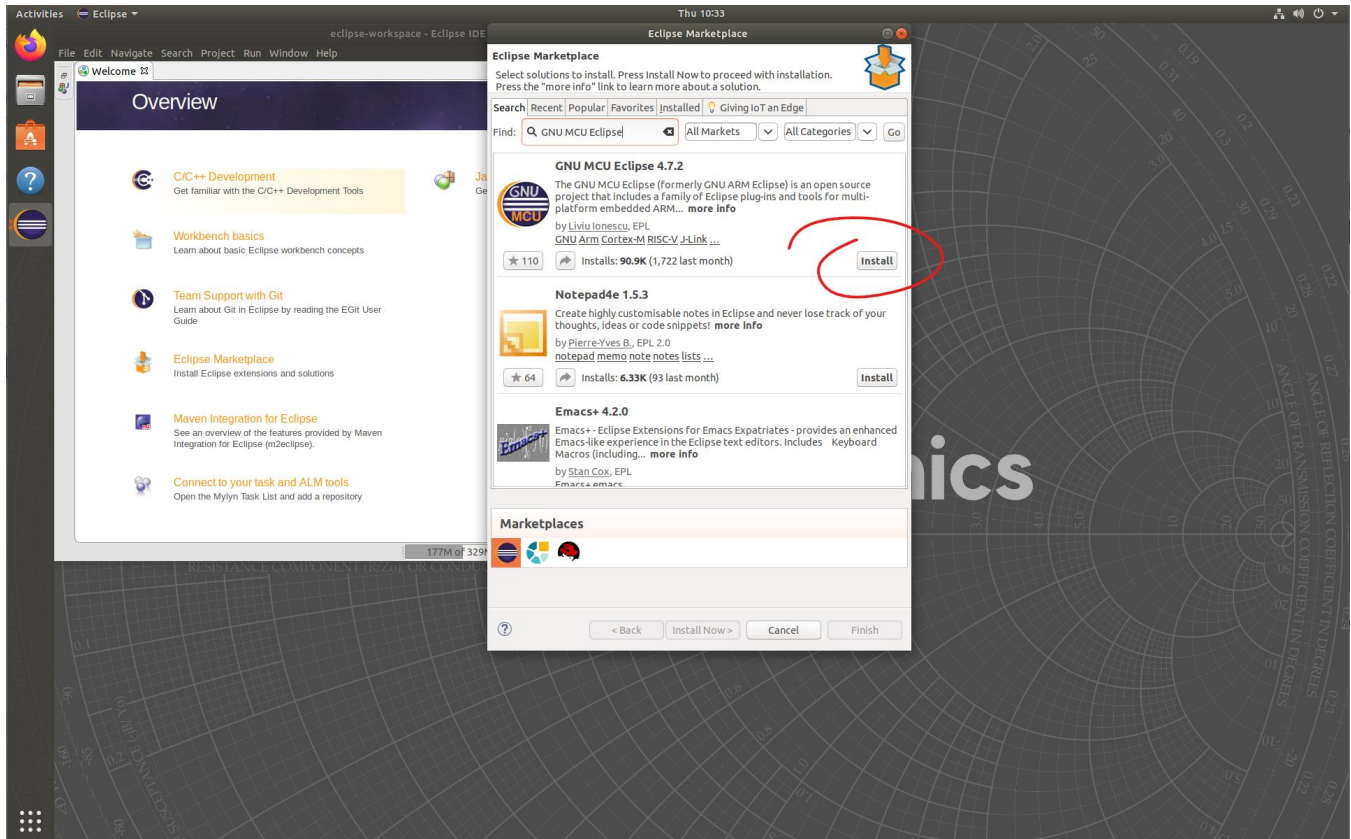


- Mark the checkbox for “C/C++ Development Tools”
- Click Next to proceed and follow the on-screen instructions to complete.
- Once the installation is completed, Eclipse will prompt for a restart. Click “Restart Now” to continue.
- We will now install the GNU MCU Eclipse plugin for cross platform embedded ARM development. With Eclipse open, click “Help” in the menu bar and then select “Eclipse Marketplace...” A new window will open.

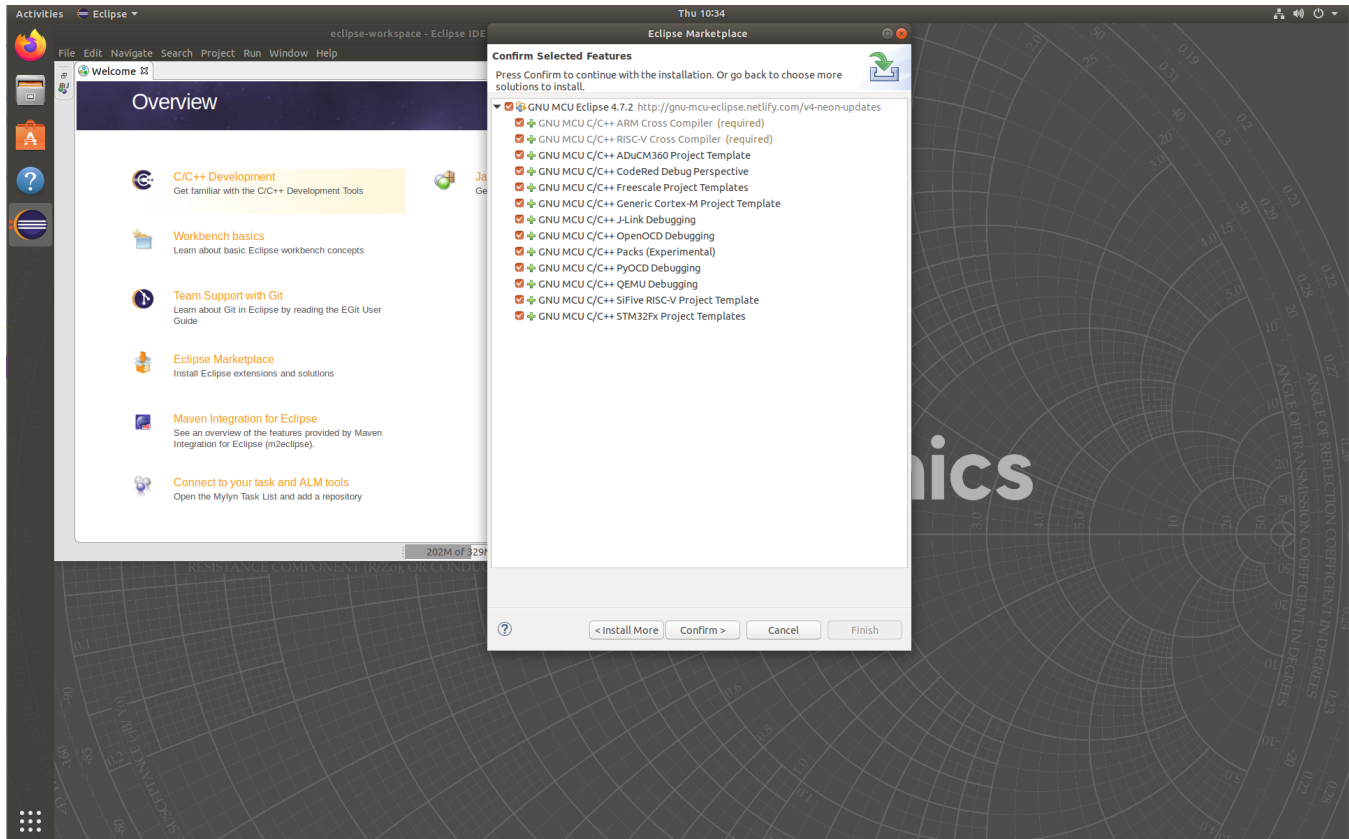
- In the Find text box, type “GNU MCU Eclipse” without the quotes and press ENTER.



- When the search results are loaded, find the entry “GNU MCU Eclipse” and click on the “Install” button



- Accept the default selection and click “Confirm”



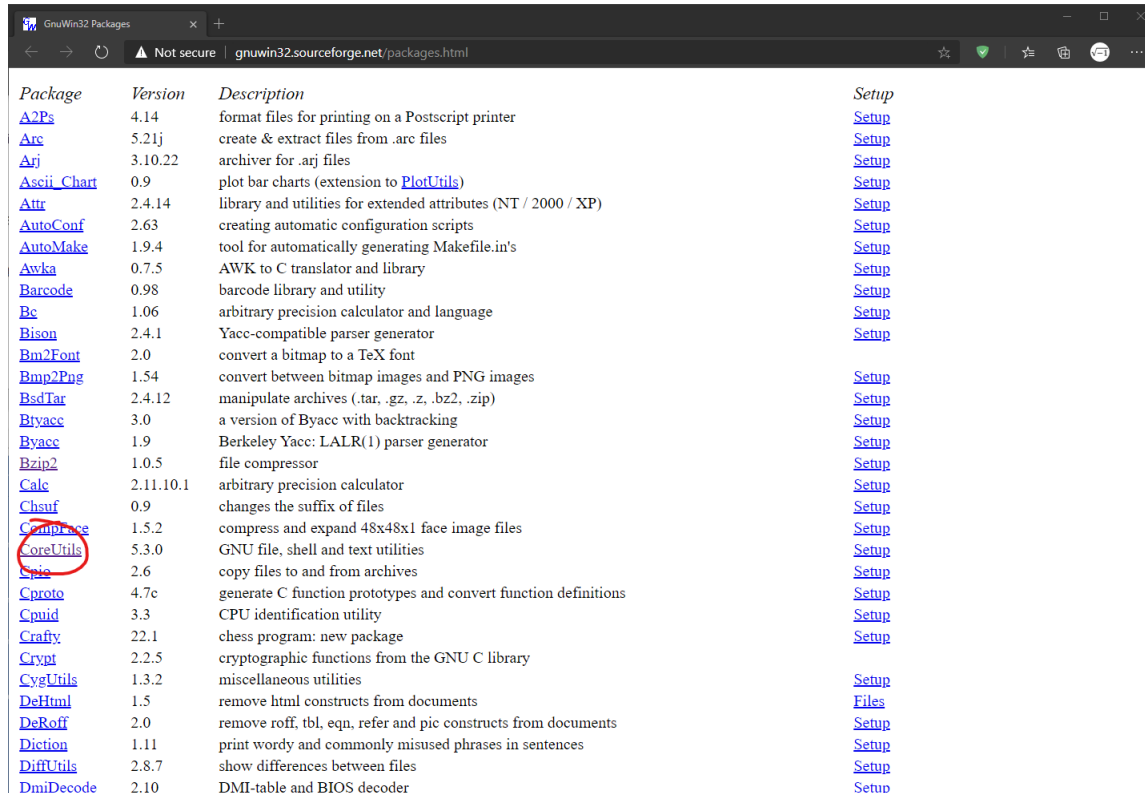
- Follow the on-screen instructions to complete. A security warning may pop-up indicating that the plugin contains unsigned content. Select “Install anyway” to complete the installation.
- Once the plugin is completed, Eclipse will prompt you to restart. Click “Restart now” to complete the eclipse development environment and toolchain installation.

## 2.2. Windows

### 2.2.1. Pre-requisite

There are four commands required from GnuWin32: cp, mkdir, rmdir, and make. They can be obtained from the packages CoreUtils and Make. There are other alternatives including but not limited to Cygwin, MinGW, or Windows Subsystem for Linux.

- Visit <http://gnuwin32.sourceforge.net/packages.html>
- Click on the package CoreUtils



Package	Version	Description	Setup
<a href="#">A2Ps</a>	4.14	format files for printing on a Postscript printer	<a href="#">Setup</a>
<a href="#">Arc</a>	5.21j	create & extract files from .arc files	<a href="#">Setup</a>
<a href="#">Arj</a>	3.10.22	archiver for .arj files	<a href="#">Setup</a>
<a href="#">Ascii_Chart</a>	0.9	plot bar charts (extension to <a href="#">PlotUtils</a> )	<a href="#">Setup</a>
<a href="#">Attr</a>	2.4.14	library and utilities for extended attributes (NT / 2000 / XP)	<a href="#">Setup</a>
<a href="#">AutoConf</a>	2.63	creating automatic configuration scripts	<a href="#">Setup</a>
<a href="#">AutoMake</a>	1.9.4	tool for automatically generating Makefile.in's	<a href="#">Setup</a>
<a href="#">Awka</a>	0.7.5	AWK to C translator and library	<a href="#">Setup</a>
<a href="#">Barcode</a>	0.98	barcode library and utility	<a href="#">Setup</a>
<a href="#">Bc</a>	1.06	arbitrary precision calculator and language	<a href="#">Setup</a>
<a href="#">Bison</a>	2.4.1	Yacc-compatible parser generator	<a href="#">Setup</a>
<a href="#">Bm2Font</a>	2.0	convert a bitmap to a TeX font	
<a href="#">Bmp2Png</a>	1.54	convert between bitmap images and PNG images	<a href="#">Setup</a>
<a href="#">BsdTar</a>	2.4.12	manipulate archives (.tar, .gz, .z, .bz2, .zip)	<a href="#">Setup</a>
<a href="#">Byacc</a>	3.0	a version of Byacc with backtracking	<a href="#">Setup</a>
<a href="#">Byacc</a>	1.9	Berkeley Yacc: LALR(1) parser generator	<a href="#">Setup</a>
<a href="#">Bzip2</a>	1.0.5	file compressor	<a href="#">Setup</a>
<a href="#">Calc</a>	2.11.10.1	arbitrary precision calculator	<a href="#">Setup</a>
<a href="#">Chauf</a>	0.9	changes the suffix of files	<a href="#">Setup</a>
<a href="#">CmpImage</a>	1.5.2	compress and expand 48x48x1 face image files	<a href="#">Setup</a>
<a href="#">CoreUtils</a>	5.3.0	GNU file, shell and text utilities	<a href="#">Setup</a>
<a href="#">Cpio</a>	2.6	copy files to and from archives	<a href="#">Setup</a>
<a href="#">Cproto</a>	4.7c	generate C function prototypes and convert function definitions	<a href="#">Setup</a>
<a href="#">Cpuid</a>	3.3	CPU identification utility	<a href="#">Setup</a>
<a href="#">Crafty</a>	22.1	chess program: new package	<a href="#">Setup</a>
<a href="#">Crypt</a>	2.2.5	cryptographic functions from the GNU C library	
<a href="#">CygUtils</a>	1.3.2	miscellaneous utilities	<a href="#">Setup</a>
<a href="#">DeHtml</a>	1.5	remove html constructs from documents	<a href="#">Files</a>
<a href="#">DeRoff</a>	2.0	remove roff, tbl, eqn, refer and pic constructs from documents	<a href="#">Setup</a>
<a href="#">Diction</a>	1.11	print wordy and commonly misused phrases in sentences	<a href="#">Setup</a>
<a href="#">DiffUtils</a>	2.8.7	show differences between files	<a href="#">Setup</a>
<a href="#">DmiDecode</a>	2.10	DMI-table and BIOS decoder	<a href="#">Setup</a>

- Download the setup package. If you choose manual installation, make sure that you download both the binaries and the dependencies.

CoreUtils for Windows

Not secure | gnuwin32.sourceforge.net/packages/coreutils.htm

- uname - Print system information.
- users - Print current user names.
- who - Print a list of all users currently logged in.
- whoami - Print effective user id.
- yes - Print a string repeatedly.

## Homepage

<http://www.gnu.org/software/coreutils>

## Download

If you download the [Setup program](#) of the package, any requirements for running applications, such as dynamic link libraries (DLL's) from the dependencies as listed below under Requirements, are already included. If you download the package as Zip files, then you must download and install the [dependencies zip file](#) yourself. Developer files (header files and libraries) from other packages are however not included; so if you wish to develop your own applications, you must separately install the required packages.

Description	Download	Size	Last change	Md5sum
• Complete package, except sources	<a href="#">Setup</a>	6439882	21 April 2005	5a3e9d30b906dadf54de0635522fd62c
• Sources	<a href="#">Setup</a>	3527755	21 April 2005	64b8f7c03895de29c6ee669c9092fe1b
• Binaries	<a href="#">Zip</a>	5176996	21 April 2005	aa7ce7f1f2befb930fb156bddea41bc4
• Dependencies	<a href="#">Zip</a>	706641	21 April 2005	6cf05855b6902dfffa2cf4ba8b90e82e6
• Documentation	<a href="#">Zip</a>	4540924	21 April 2005	ee0b456daf011d6e348cc64adafe968a
• Sources	<a href="#">Zip</a>	9371720	21 April 2005	5cbd86c56e6eb29b6af2810849d08c8c

You can also download the files from the GnuWin32 [files page](#).

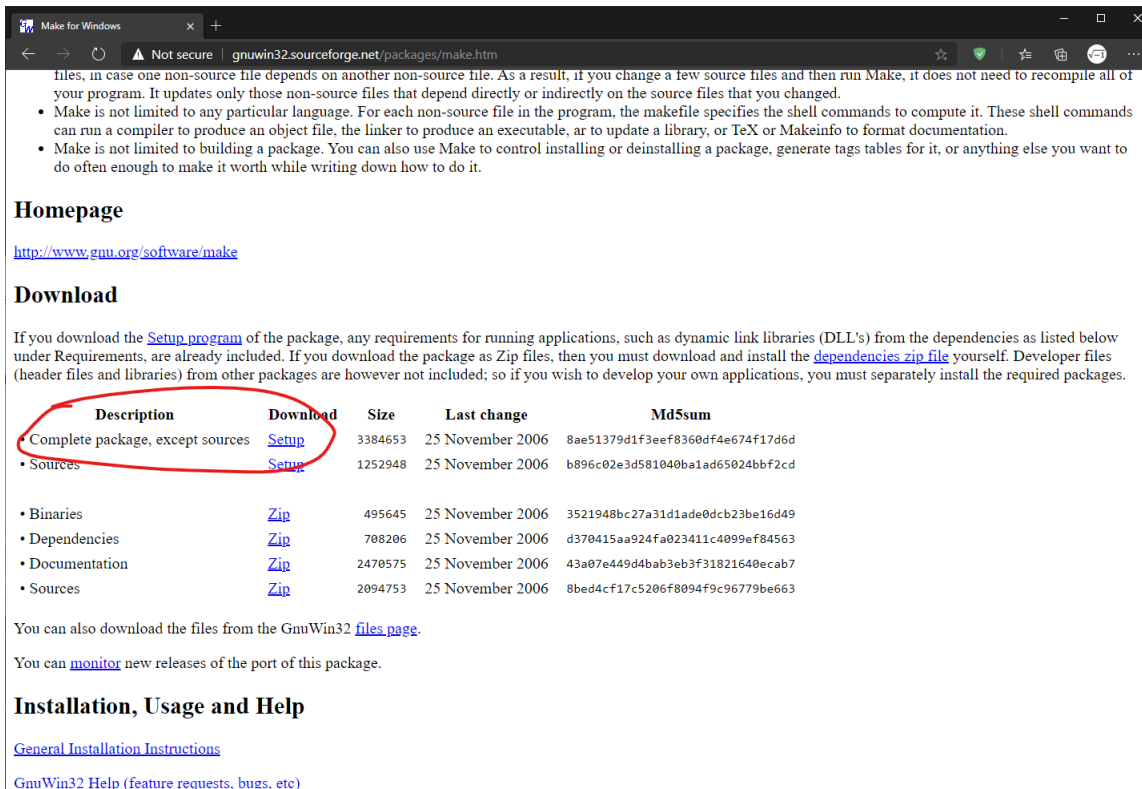
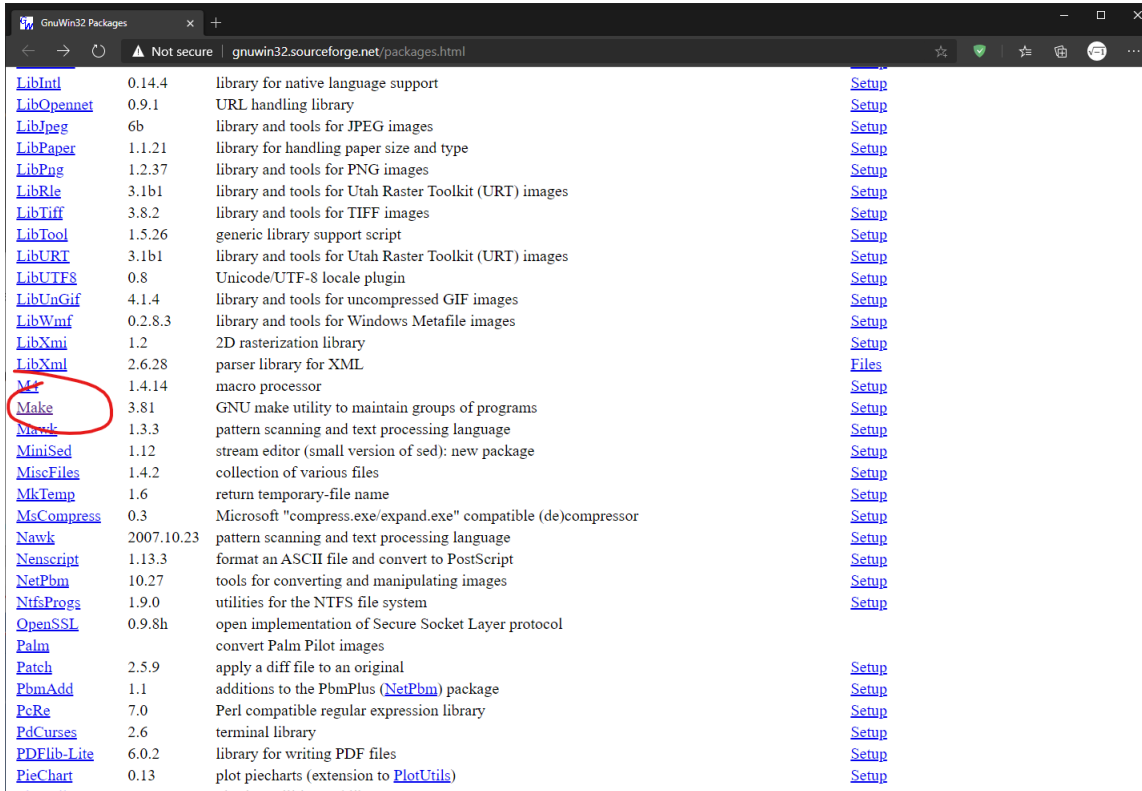
You can [monitor](#) new releases of the port of this package.

## Installation and Usage

The MS-Windows version of ln implements soft links as MS-Windows shortcuts. If necessary, it adds the extension .lnk Hard links are implemented as copies on MS-Windows-95 / 98 / ME, and as hard links on MS-Windows-NT / 2000 / XP.

[General Installation Instructions](#)

- Repeat the above two steps for Make

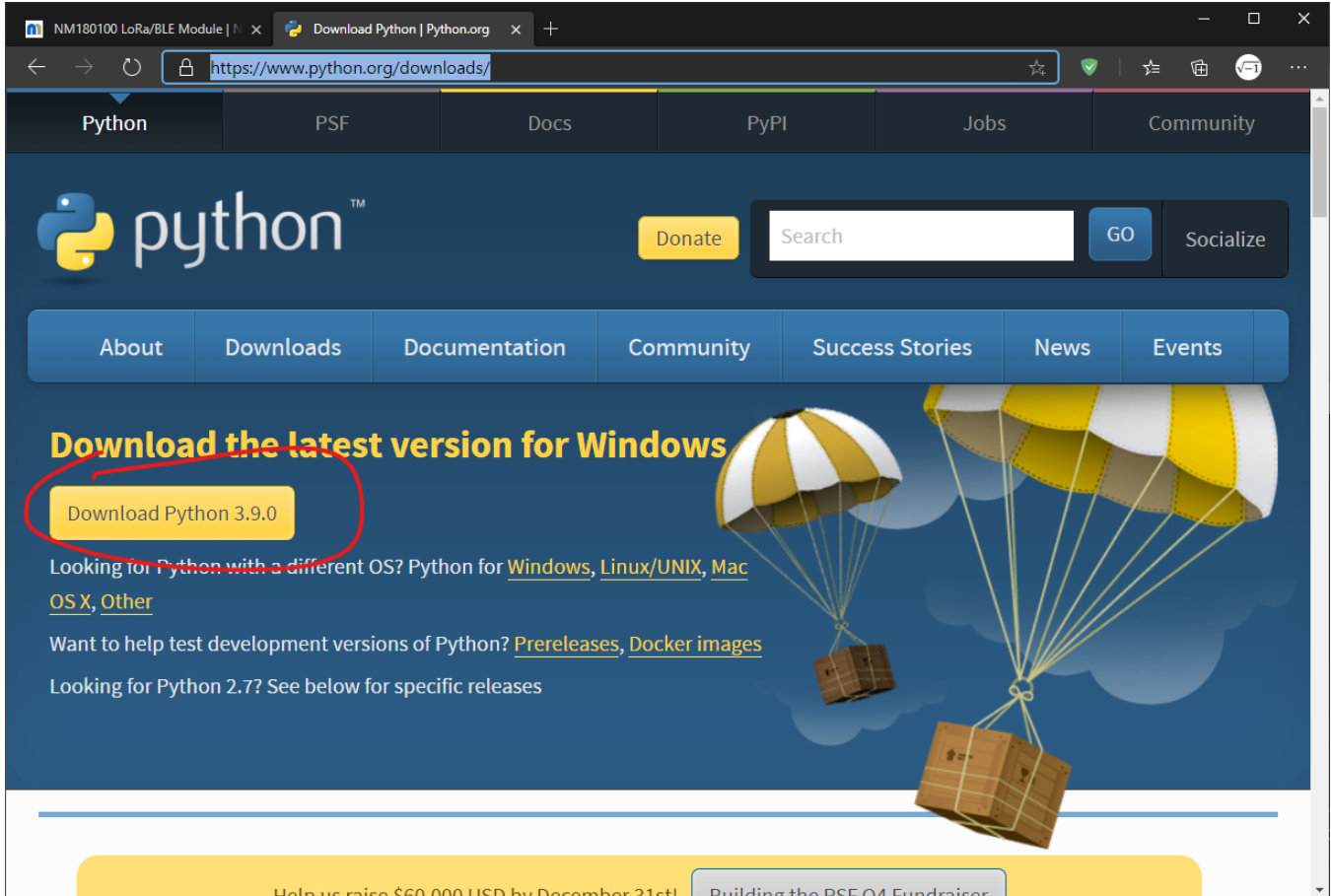




## 2.2.2. Python Installation

Python is needed to dynamically generate the board support package including the pin definition header and source files.

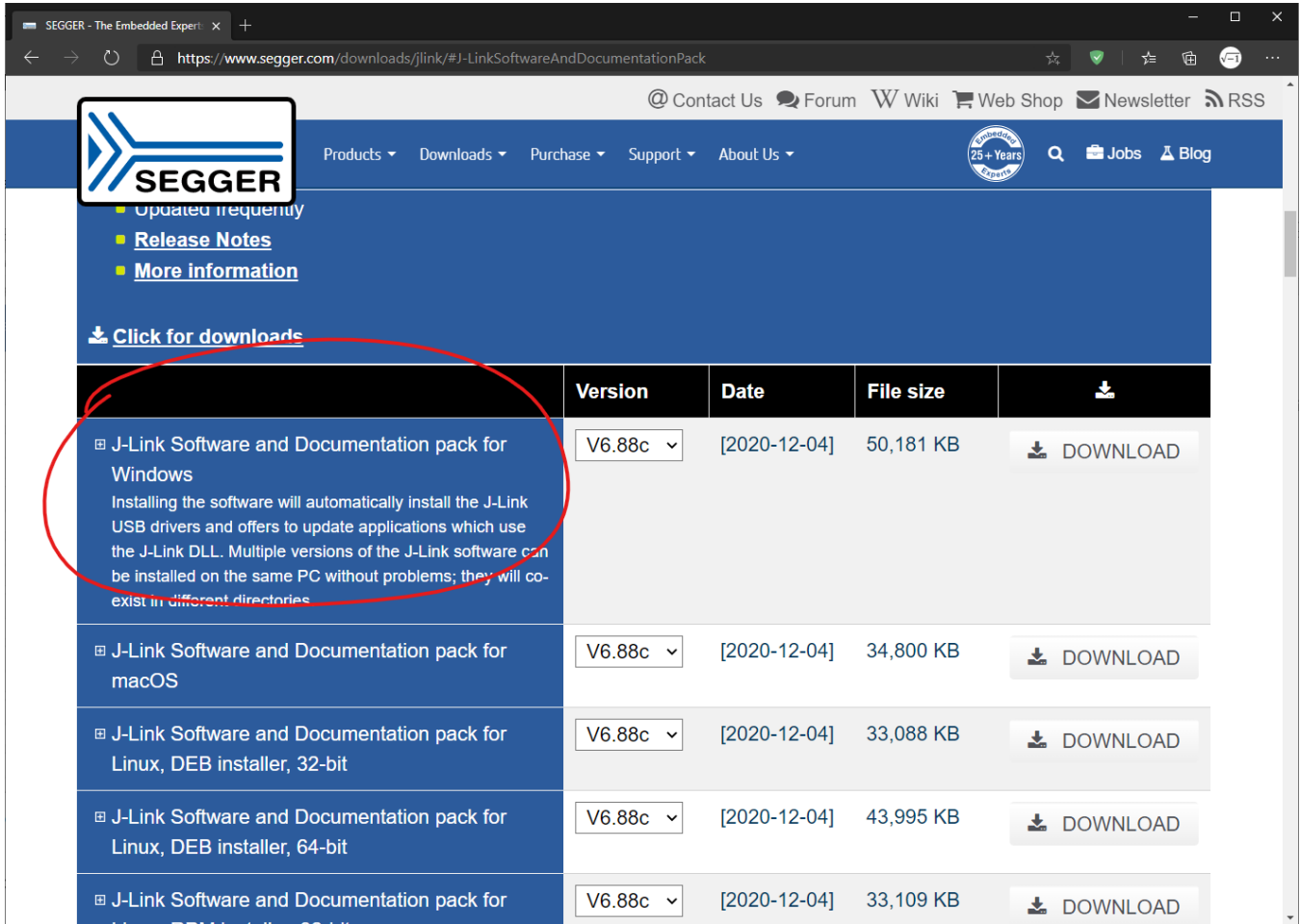
- Visit <https://www.python.org/downloads/>
- Download the latest version for Windows and follow the on-screen instructions.



### 2.2.3. SEGGER J-Link Installation

Follow the steps in 2.1.3 and download the Windows version of J-Link at

<https://www.segger.com/downloads/jlink/#J-LinkSoftwareAndDocumentationPack>



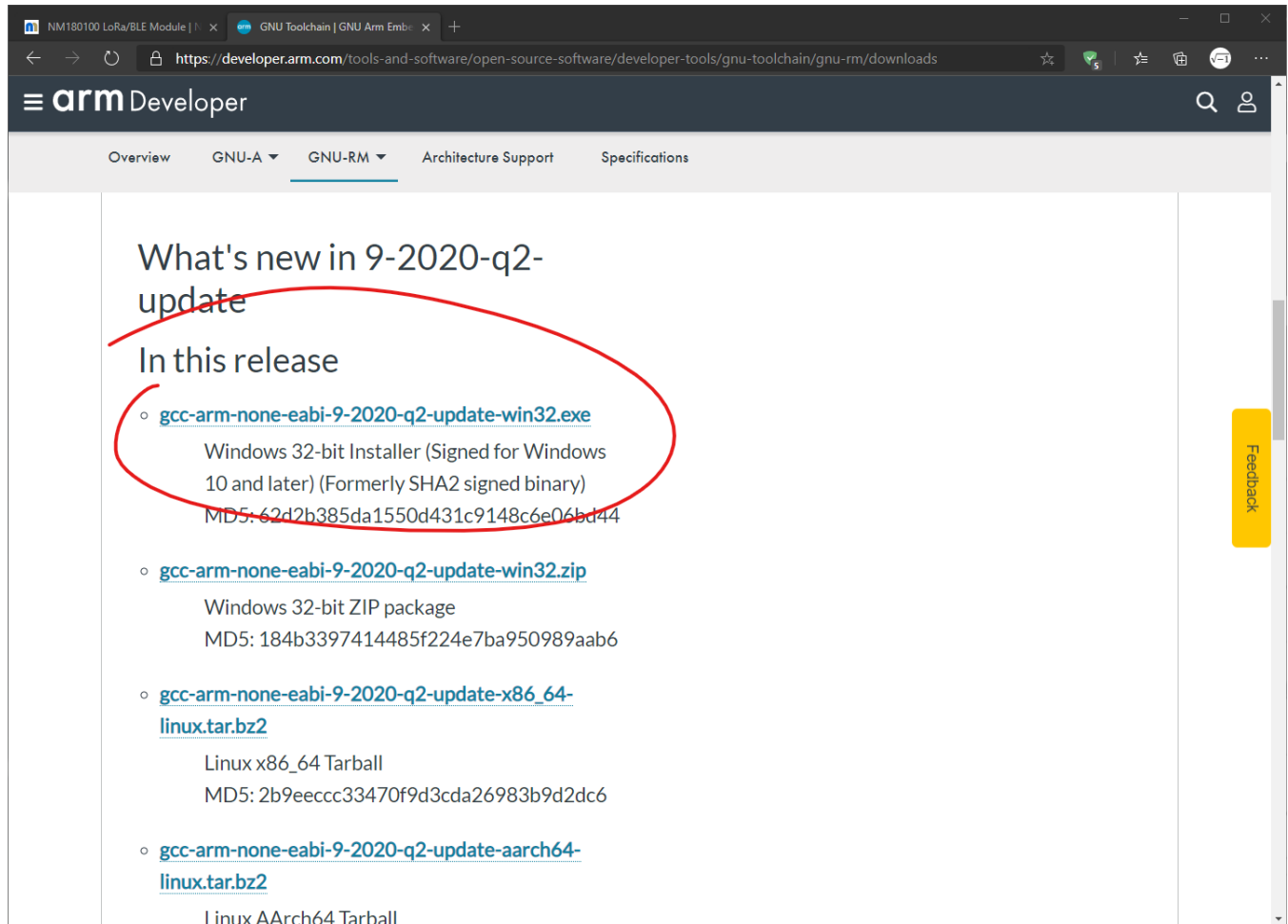
The screenshot shows the Segger website's download page for J-Link software. The page features a navigation bar with links for Contact Us, Forum, Wiki, Web Shop, Newsletter, and RSS. Below the navigation bar, there are links for Products, Downloads, Purchase, Support, and About Us. A search bar and a '25+ Years' anniversary badge are also present. The main content area includes a 'Click for downloads' link and a table of software packages. The first row of the table, representing the Windows version, is circled in red.

	Version	Date	File size	
<input type="checkbox"/> J-Link Software and Documentation pack for Windows Installing the software will automatically install the J-Link USB drivers and offers to update applications which use the J-Link DLL. Multiple versions of the J-Link software can be installed on the same PC without problems; they will co-exist in different directories.	V6.88c	[2020-12-04]	50,181 KB	DOWNLOAD
<input type="checkbox"/> J-Link Software and Documentation pack for macOS	V6.88c	[2020-12-04]	34,800 KB	DOWNLOAD
<input type="checkbox"/> J-Link Software and Documentation pack for Linux, DEB installer, 32-bit	V6.88c	[2020-12-04]	33,088 KB	DOWNLOAD
<input type="checkbox"/> J-Link Software and Documentation pack for Linux, DEB installer, 64-bit	V6.88c	[2020-12-04]	43,995 KB	DOWNLOAD
<input type="checkbox"/> J-Link Software and Documentation pack for Linux, RPM installer, 64-bit	V6.88c	[2020-12-04]	33,109 KB	DOWNLOAD

## 2.2.4. GNU ARM Embedded Toolchain Installation

Follow the steps in 2.1.4 and download the Windows version of GNU toolchain at

<https://developer.arm.com/tools-and-software/open-source-software/developer-tools/gnu-toolchain/gnu-rm/downloads>



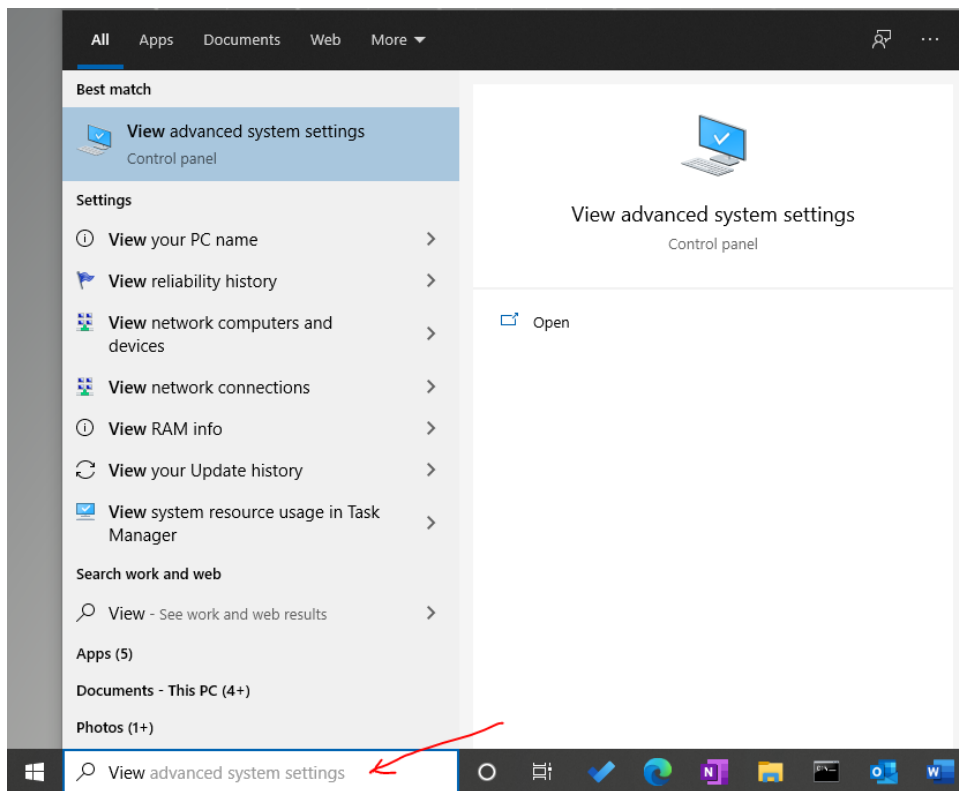
What's new in 9-2020-q2-update

In this release

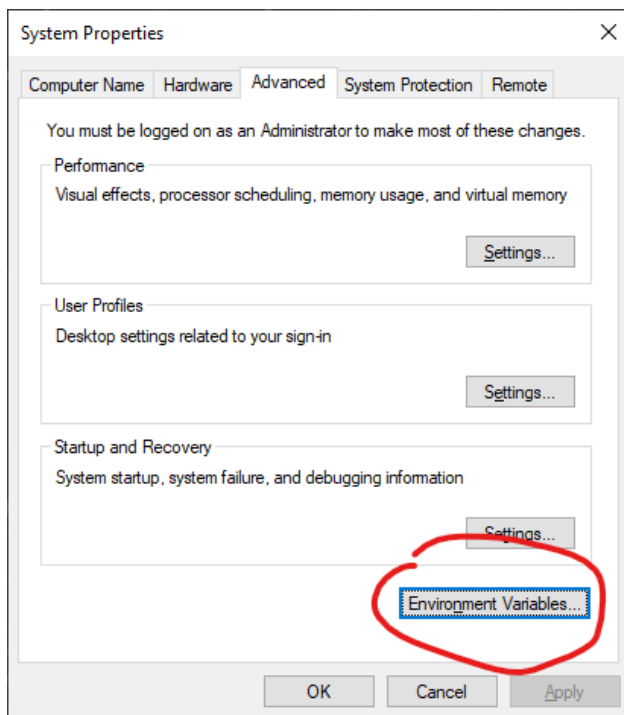
- [gcc-arm-none-eabi-9-2020-q2-update-win32.exe](#)  
Windows 32-bit Installer (Signed for Windows 10 and later) (Formerly SHA2 signed binary)  
MD5: 62d2b385da1550d431c9148c6e06bd44
- [gcc-arm-none-eabi-9-2020-q2-update-win32.zip](#)  
Windows 32-bit ZIP package  
MD5: 184b3397414485f224e7ba950989aab6
- [gcc-arm-none-eabi-9-2020-q2-update-x86\\_64-linux.tar.bz2](#)  
Linux x86\_64 Tarball  
MD5: 2b9ecccc33470f9d3cda26983b9d2dc6
- [gcc-arm-none-eabi-9-2020-q2-update-aarch64-linux.tar.bz2](#)  
Linux AArch64 Tarball

## 2.2.5. Executable Search Path

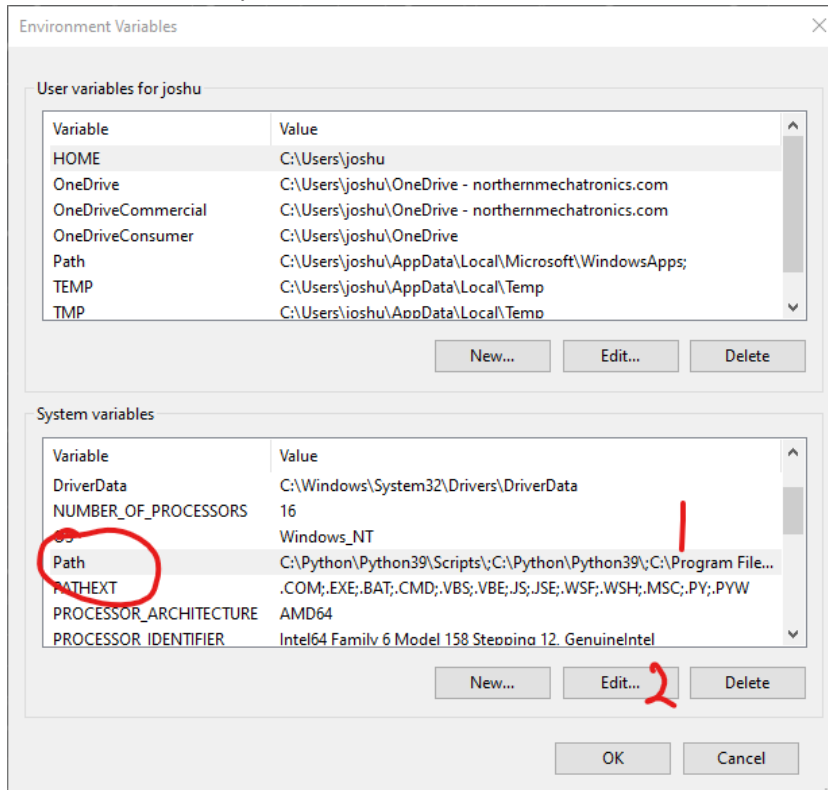
- Finally ensure that the paths to all the executables are added to your search path.
  1. Type “View Advanced System Settings” in the Windows search bar



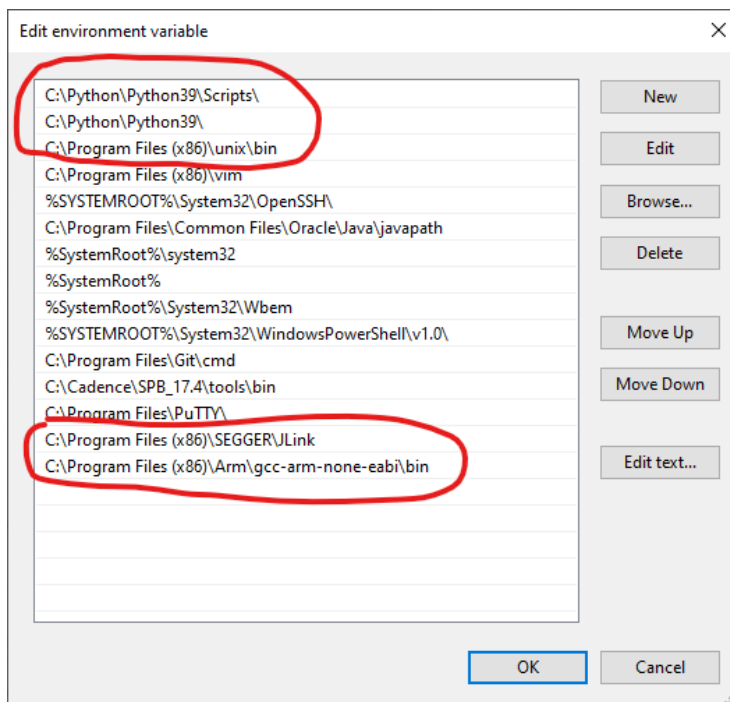
## 2. Click on Environment Variables



3. Select Path under System variables and click "Edit..."



4. If not done already, add the paths where you have installed Python, GnuWin32, J-Link and Arm GNU Toolchain

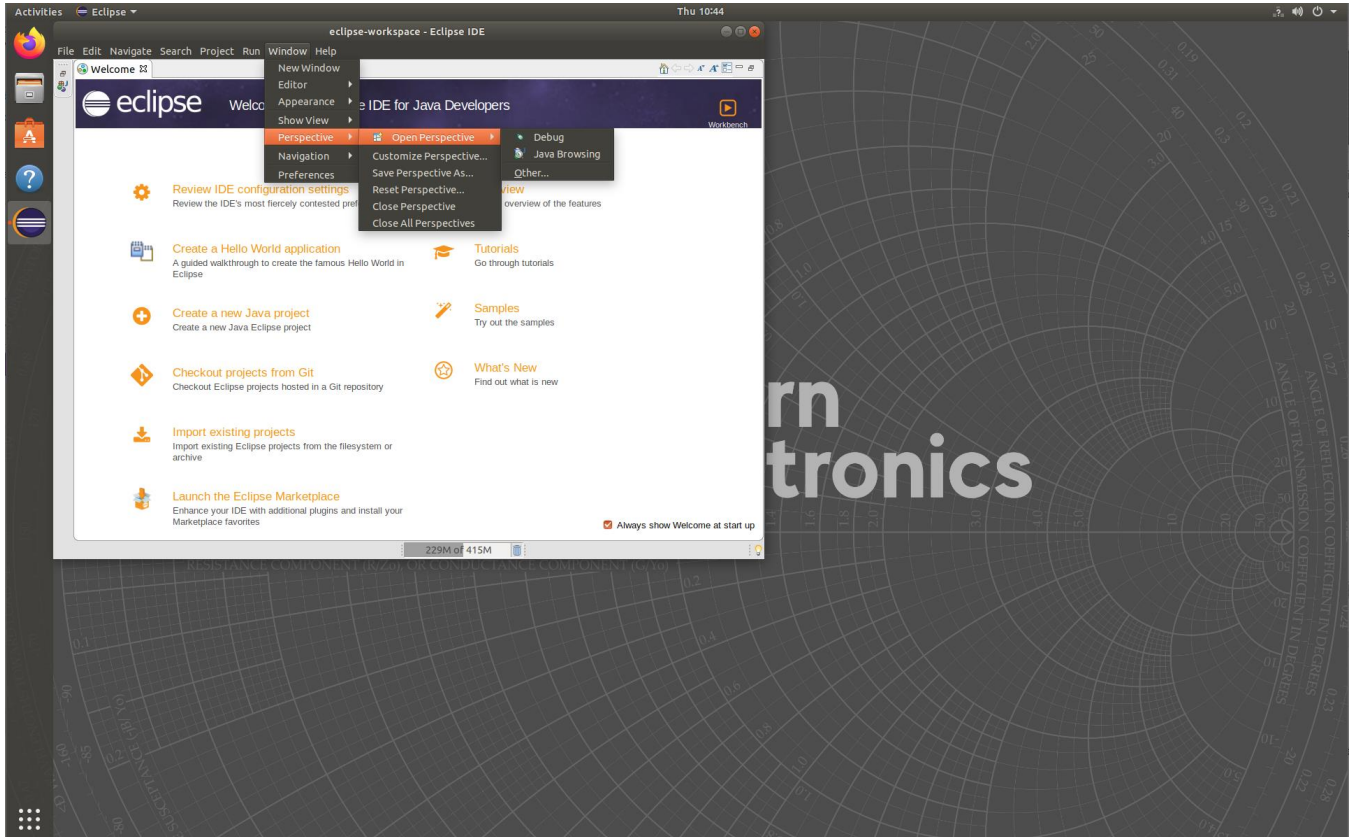


### 3. Eclipse Configuration

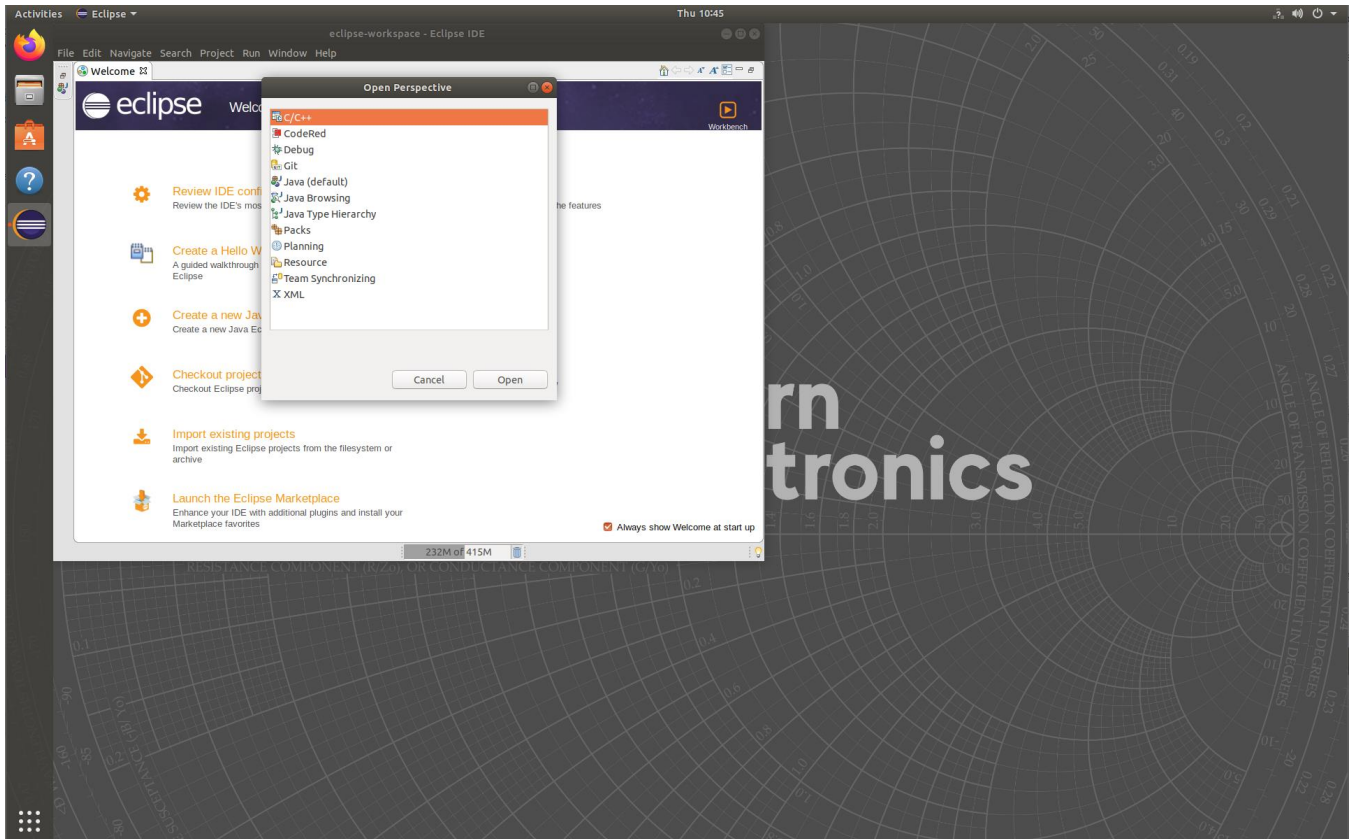
#### 3.1. C/C++ Environment Setup

Eclipse defaults to the Java language development environment. You can change this by opening the C/C++ perspective.

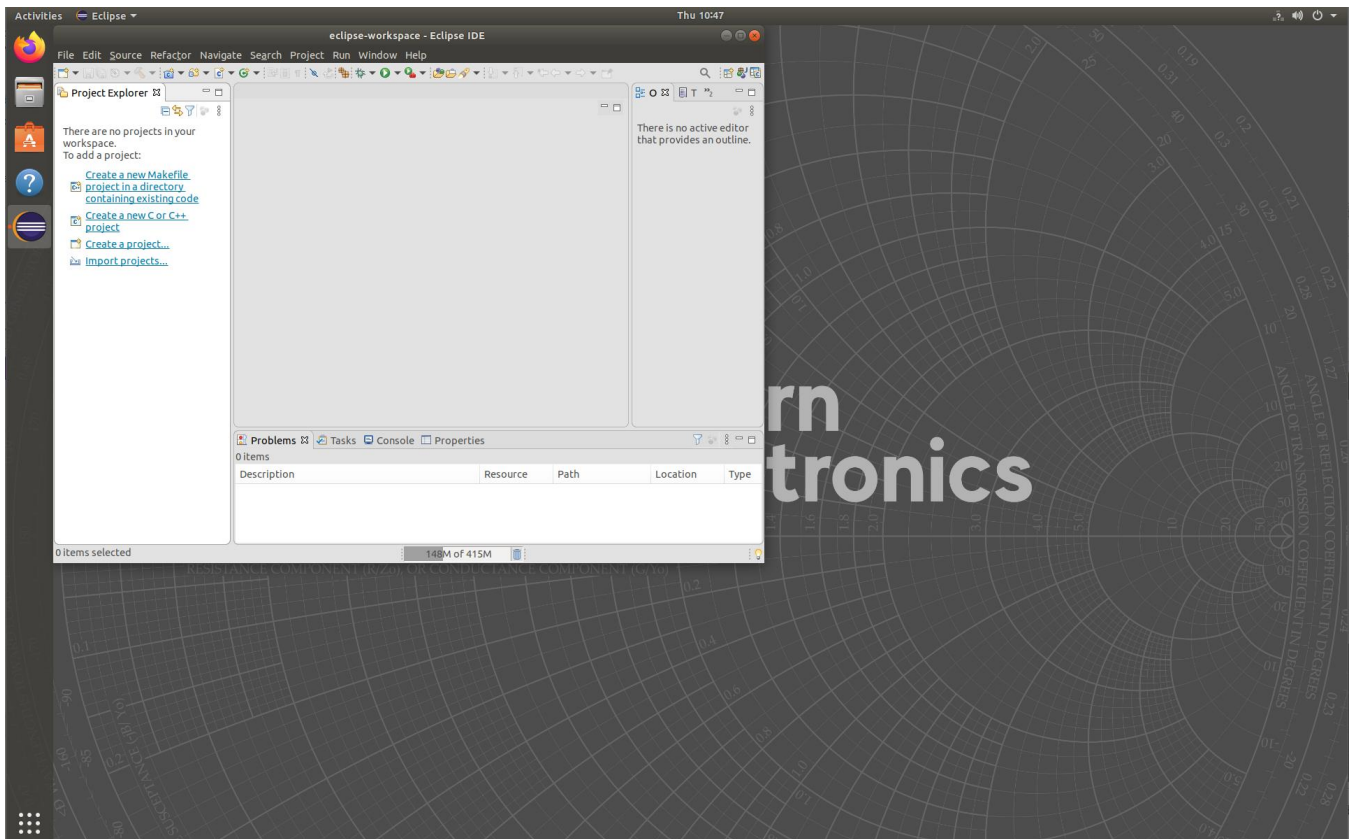
- With Eclipse opened, click on “Window”, “Perspective”, “Open Perspective”, and finally “Other...”



- This opens a new Window. Select “C/C++” and click “Open”



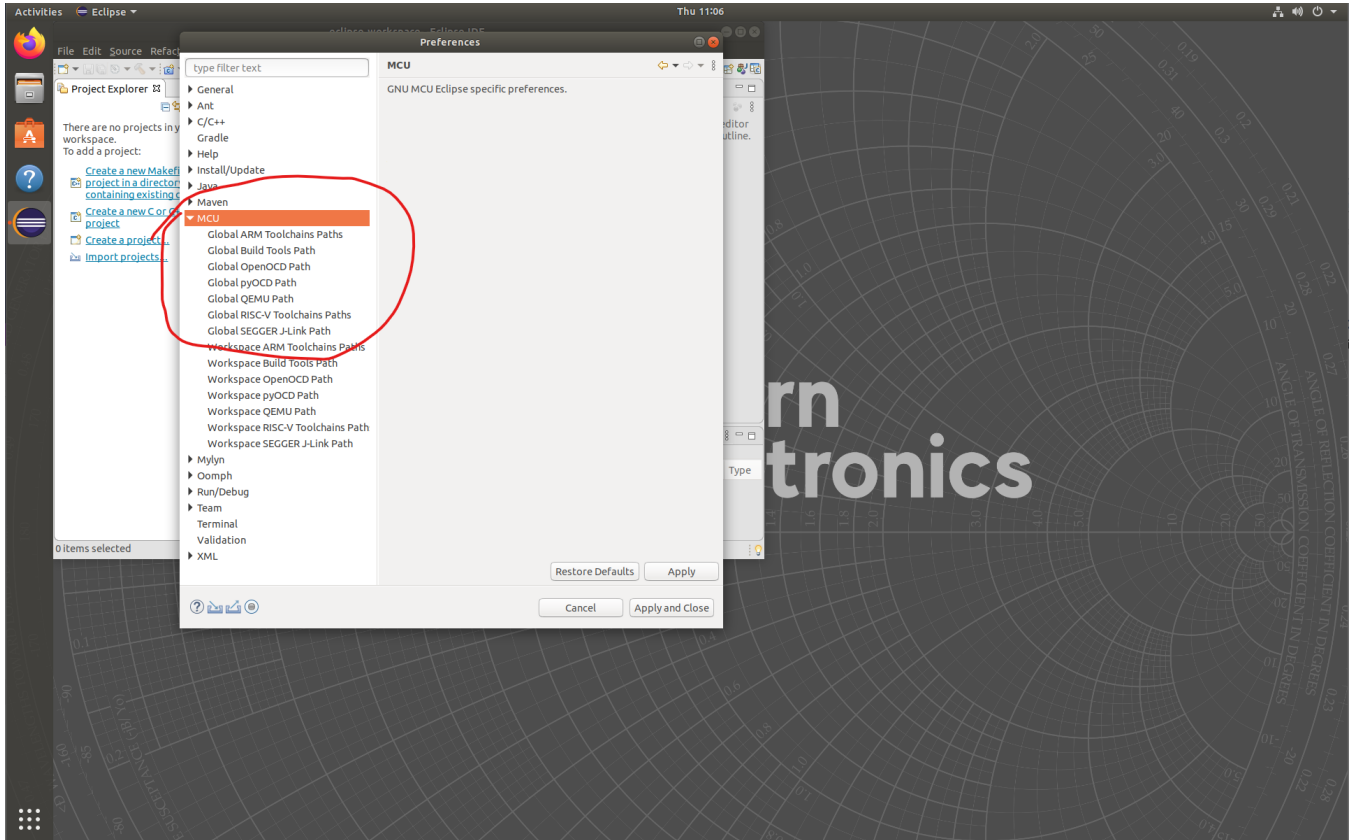
- Close or minimize the “Welcome” tab and you will be presented with the C/C++ environment.



### 3.2. Eclipse GNU MCU Configuration

Finally, we will configure the GNU MCU plugin by specifying the location of the GNU ARM toolchain installation location.

- With Eclipse open, click “Window” in the menu bar and select “Preferences”

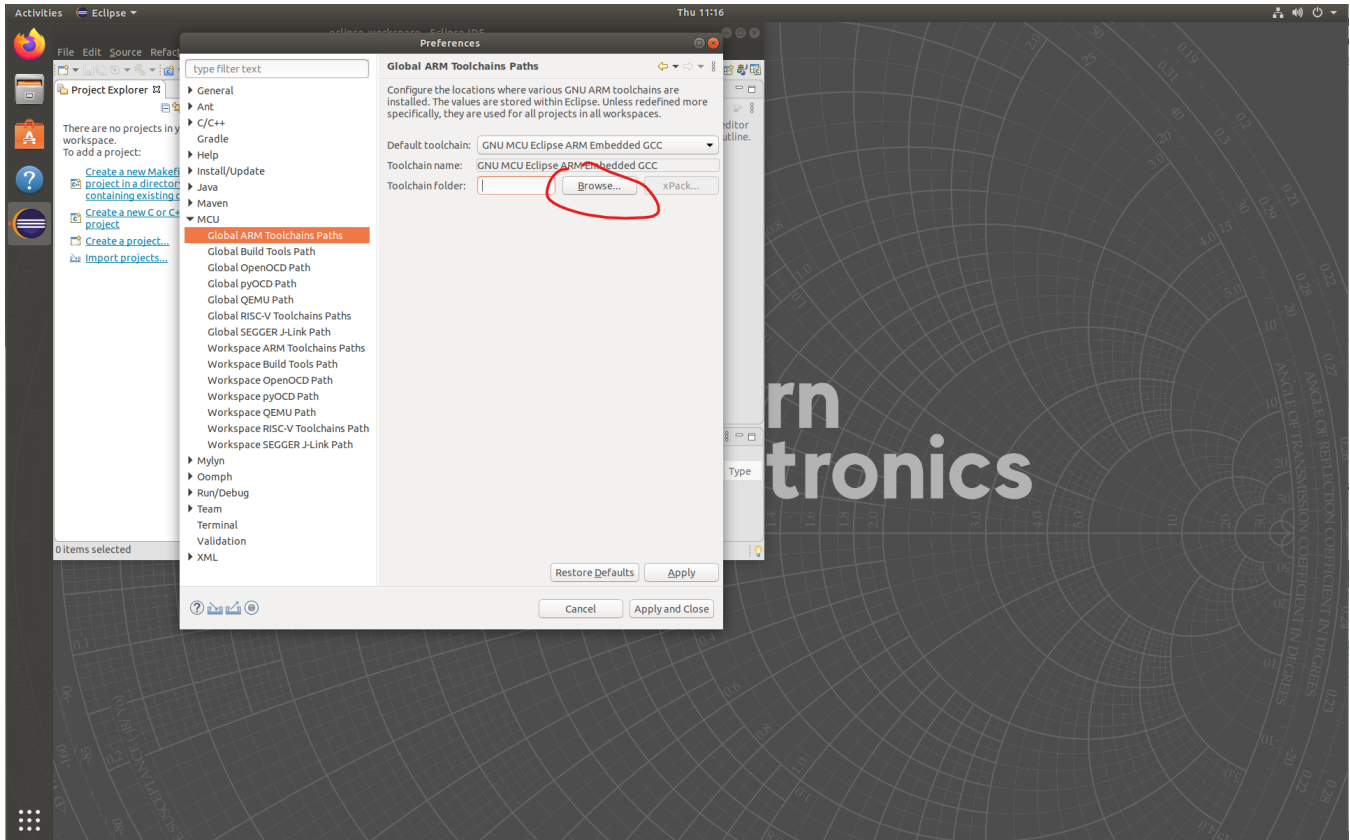


- Find and expand the row containing “MCU”
- The items under “MCU” are prefixed by either “Global” and “Workspace”. We will focus on the Global settings right now. These settings are the global default.
- There are two paths we need to configure:
  - Global ARM Toolchains Paths
  - Global SEGGER J-Link Path



### 3.2.1. Global ARM Toolchains Paths Configuration

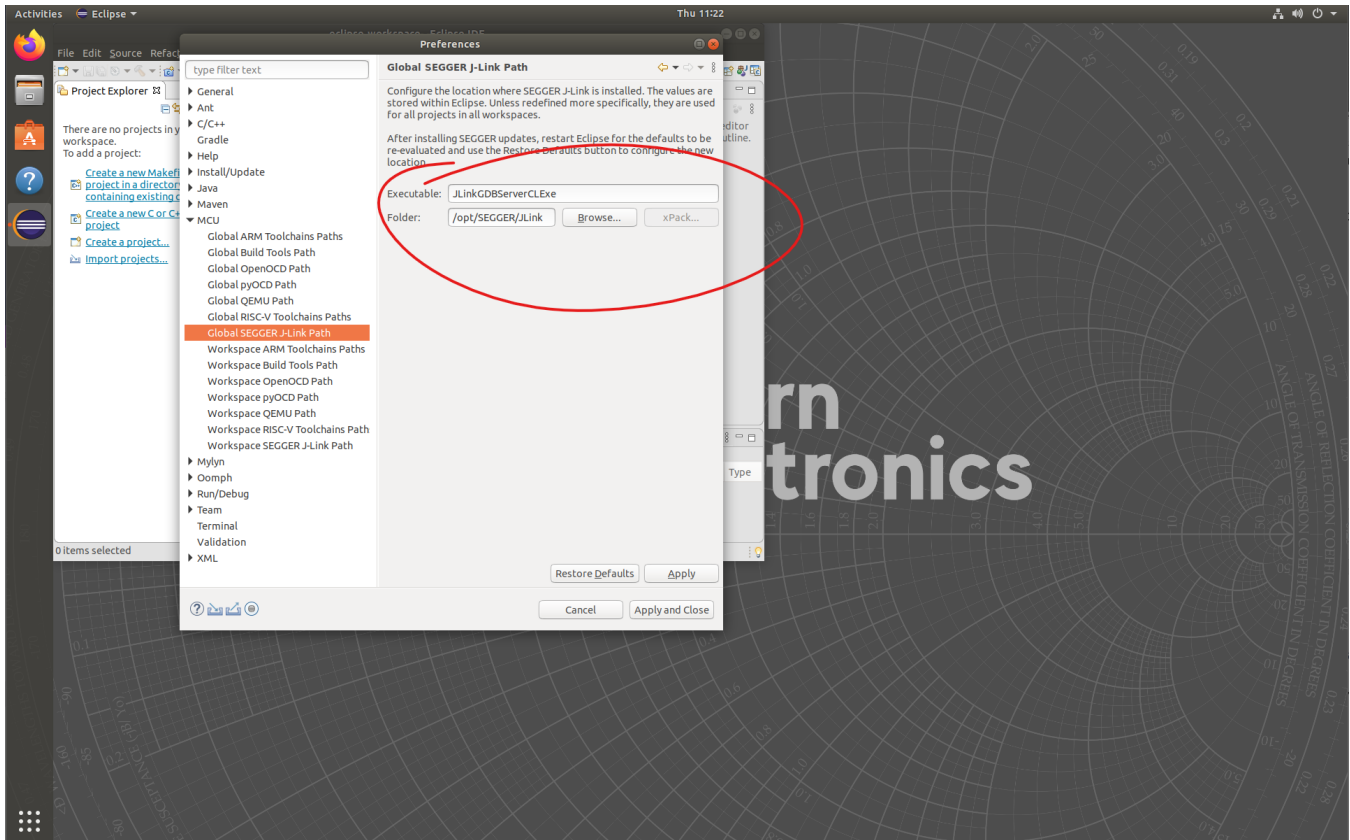
- With the Preference dialog window open, select “Global ARM Toolchains Paths” under MCU and click on “Browse”



- Browse to the location where the ARM toolchain was installed in 2.1.4. In our example, this is located under  
`/opt/gcc-arm-none-eabi-9-2020-q2-update/bin`
- click “Apply” to apply the changes.

### 3.2.2. Global SEGGER J-Link Path Configuration

- With the Preference dialog window open, select “Global SEGGER J-Link Path” under MCU.



- The plugin should automatically detect the SEGGER J-Link installation. If not, enter the values into the Executable and Folder text boxes as shown in the screenshot.

Executable: JLinkGDBServerCLExe

Folder: /opt/SEGGER/JLink (or the path where you have installed SEGGER Jlink)

- Click “Apply and Close” to apply the changes.
- The Eclipse development environment is now completely configured.

#### 4. Document Details

Parameter	Value
<b>Name</b>	NM180100 Software Development Toolchain Setup
<b>Number</b>	2000012
<b>Revision</b>	A.7
<b>Life Cycle State</b>	Released