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How to Setup MPLAB Harmony v3 Software Development Framework

Introduction

MPLAB® Harmony v3 is a software development framework consisting of compatible and inter-operational modules, such as peripheral libraries (PLIBs), drivers, system services, middleware and third-party libraries. The software development framework comes with a GUI tool, MPLAB Harmony Configurator (MHC), which provides an easy way to enable, configure, and use various MPLAB Harmony modules.

This document describes how to set up the MPLAB Harmony v3 software development framework on a computer, which can be used to develop applications.

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1.   Description

Follow these steps to setup and use the MPLAB Harmony v3 software development framework:

1. Download and Install MPLAB® X Integrated Development Environment (IDE).
   Note: If MPLAB X IDE is installed, skip this step and go to step 3, if not download the latest version of the MPLAB® X IDE.

2. Run the installer and follow the instructions prompted on the screen.

3. To download and install the MPLAB Harmony v3 Configurator (MHC) plugin, follow these steps:

   3.1.   Launch MPLAB X IDE.

   3.2.   Select **Tools > Plugins**. The Plugins window will be displayed.

   3.3.   Click on the **Available Plugins** tab, and then select **MPLAB Harmony 3 Configurator.**

   3.4.   Click **Install**, and follow the instructions prompted by the Plugin Installer.

   Figure 1-1.   MHC 3 Plugins Window
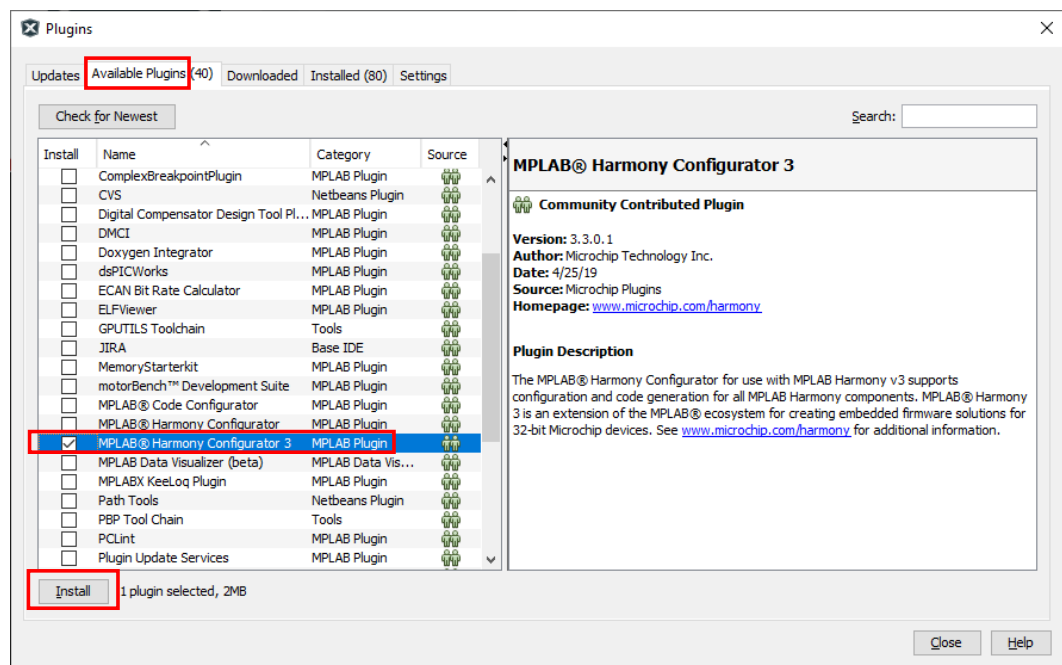
   3.5.   In the plugin Installer window, select **Restart Now**, and then click **Finish**.

Figure 1-2. Plugin Installer
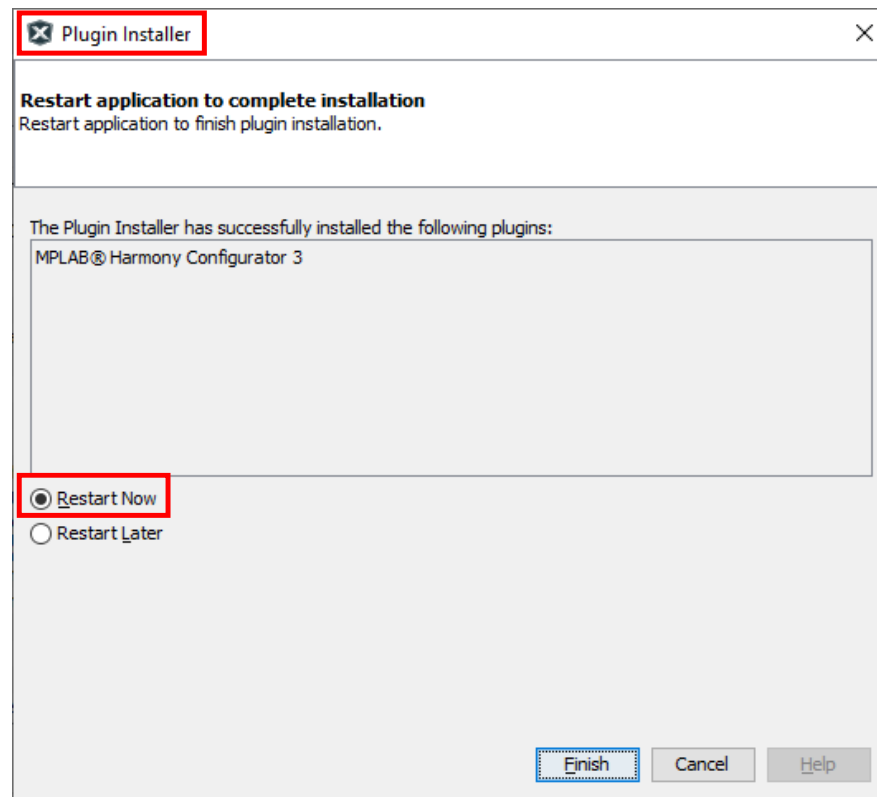
4. MPLAB Harmony v3 contents are grouped in multiple packages, which are available for download in the GitHub repository at: https://github.com/Microchip-MPLAB-Harmony/. All these packages are not required for the development of an application, hence users can download only the required packages.
   The following packages are mandatory to use MPLAB Harmony v3:

   – **dev_packs:** This repository contains all the device-related information in the form of Atmel pack Description Files (ATDF) of the devices (both PIC® and SAM) which are supported in MPLAB Harmony v3. For SAM devices, it contains the device headers and Cortex® Microcontroller Software Interface Standard (CMSIS) which are needed to compile the MPLAB Harmony v3 projects.
   – **mhc:** This repository contains the implementation of the MPLAB Harmony Configurator (MHC), which is a Graphical User Interface (GUI) based configuration utility that accelerates the development of embedded applications using 32-bit SAM and PIC devices.
   – **csp:** This repository contains the MPLAB Harmony v3 Chip Support Package (CSP). The CSP supports the initialization of Microchip 32-bit SAM and PIC microcontroller and microprocessor devices. It provides Application Program Interfaces (APIs) to develop simple applications that control peripheral hardware with minimal external dependencies.

   The following packages are optional and can be downloaded when needed:

   – **core:** This repository provides drivers and services with simple to use abstractions of peripherals and shared resources on Microchip 32-bit SAM and PIC devices. Drivers and services may also provide advanced capabilities, such as buffer queuing, peripheral sharing, and RTOS support.
   – **gfx:** The graphics repository contains the files for the MPLAB Harmony Graphics Suite, quick-start applications, drivers, tools, libraries, and templates.
   – **usb:** The USB repository provides the USB controller drivers for 32-bit PIC and SAM devices, as well as Host and Device middleware with support for common device classes.
   – **net:** This repository provides a fast-to-market TCP/IP stack for 32-bit PIC and SAM microcontrollers. It contains multiple applications that demonstrate communication over the TCP/IP using well-known protocols, such as TCP, UDP, HTTP, SMTP, and so on.

– **others:** There are many other packages which are supported in MPLAB Harmony v3, refer to the MPLAB Harmony GitHub repository mentioned above for details.

Users can download the MPLAB Harmony v3 packages using any one of these options:

– **Using the MPLAB Harmony v3 Content Manager:** To download any MPLAB Harmony v3 package, from MPLAB X IDE, select *Tools > Embedded > MPLAB Harmony 3 Content Manager* and follow the steps on the screen to copy (clone) the repositories to a selected folder on the user's computer. Refer to MPLAB Harmony v3 Configurator Overview for more details.

– **Manually cloning from GitHub:** To manually clone a repository, follow the instructions available at: https://help.github.com/en/articles/cloning-a-repository.
Note: After all the required MPLAB Harmony v3 repositories are cloned, these repositories must be in the same folder as shown in the following figure.

Figure 1-3. MPLAB Harmony v3 Packages
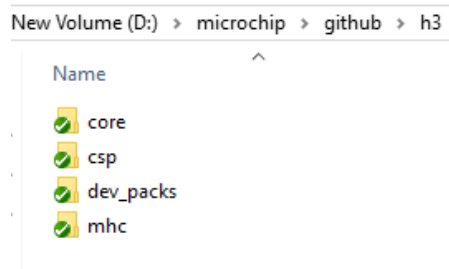
⚠ **CAUTION** GitHub provides a clone or download option on a repository page. While this option is provided by GitHub to download a repository, it is discouraged to use this option for MPLAB Harmony v3 repositories. Using this option will render certain MPLAB Harmony v3 features inoperable.

5. **Creating a MPLAB Harmony v3 Project:** After the required MPLAB Harmony v3 repositories are available in a folder, follow the instructions given in the link to create a MPLAB Harmony v3 project: https://github.com/Microchip-MPLAB-Harmony/csp/wiki/Create-your-first-Microchip-MPLAB%C2%AE-Harmony-3-peripheral-library-project.

Note: All MPLAB Harmony v3 projects are standalone, which can be created at any location on the computer (irrespective of H3 repositories location), and ported to any other computer.

2.   References

- For additional information on MPLAB Harmony v3, visit the following Microchip website: https://www.microchip.com/mplab/mplab-harmony

  https://microchipdeveloper.com/harmony3:start
- GitHub help is available at https://help.github.com/
- Getting started with Git (version control) is available at https://git-scm.com/book/en/v2/Getting-Started-About-Version-Control

3. Revision History

Revision C - 04/2020

Removed obsolete information about downloading from GitHub in Step Four.

Revision B - 02/2020

Typographical corrections were done throughout the document.

Revision A - 11/2019

This is the initial released version of this document.

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