

MPLAB® Harmony for PIC32

Integrated, Single Platform Firmware Development Environment

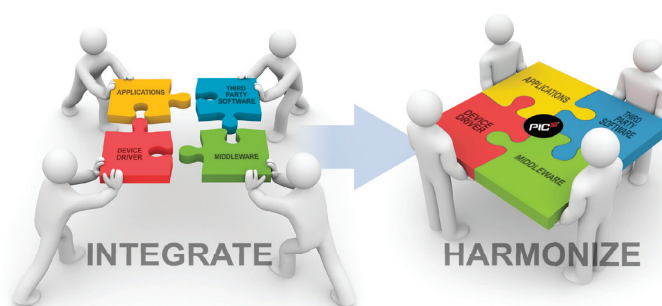
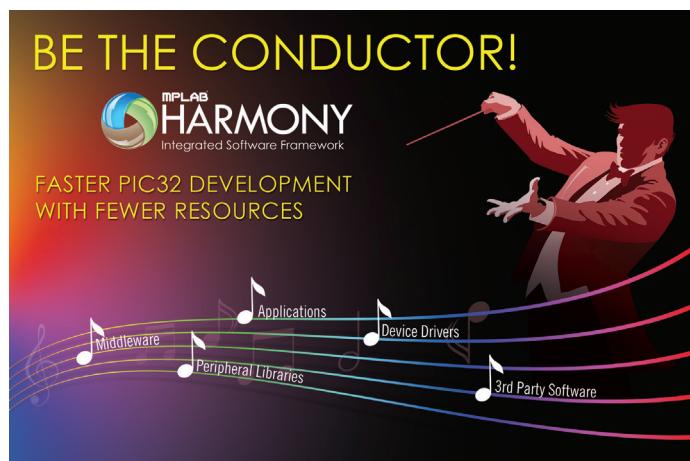
Summary

MPLAB Harmony is a flexible, abstracted, fully integrated firmware development environment for PIC32 microcontrollers. It enables robust framework development of interoperable RTOS-friendly libraries with quick and extensive Microchip support for third party software integration.

MPLAB Harmony includes a set of peripheral libraries, drivers and system services that are readily accessible for application development. The code development format allows for maximum re-use and reduces time-to-market.

Benefits

- Faster time-to-market
 - Production ready libraries provide seamless system integration
 - Integrated single platform enables shorter development time
 - Tested and debugged libraries give customers more time for application development
- Improved code interoperability
 - Modular architecture allows drivers and libraries to work together with minimal effort
 - Application software can be easily scaled to different end-systems
- Simplified support
 - Common software platform with standard interface ensures efficient Microchip support
- Improved 32-bit scalability
 - MPLAB Harmony allows for easier PIC32 part-to-part portability
- Enhanced third party software integration
 - Smooth integration of third party solutions (RTOS, middleware, drivers) to the software network
 - Direct re-sell and front line support provided by Microchip for select third party solutions



MPLAB® Harmony

PIC32 Software Development Tools Available with MPLAB Harmony

Applications	Operating System Abstract Layer (OSAL)	Middleware/ Software Libraries	Device Drivers	Development Software	Third Party Software
■ Graphics applications ■ TCP/IP applications and utilities ■ USB applications	■ OSAL interface with “basic” and “none” implementation ■ OSAL implementation for FreeRTOS ■ OSAL implementation for Micrium µC/OS-III	■ Graphics ■ TCP/IP ■ USB ■ Cryptographic libraries ■ File systems ■ System services	■ ADC ■ Ethernet media access controller ■ Ethernet PHY interface ■ Controllerless graphics ■ Epson LCD controller ■ Non-volatile memory ■ SPI, USART, high-speed USB ■ Timer, parallel master port	■ MPLAB® X IDE ■ MPLAB XC32++	■ FreeRTOS* ■ OpenRTOS* ■ TCP/IP* ■ SSL libraries

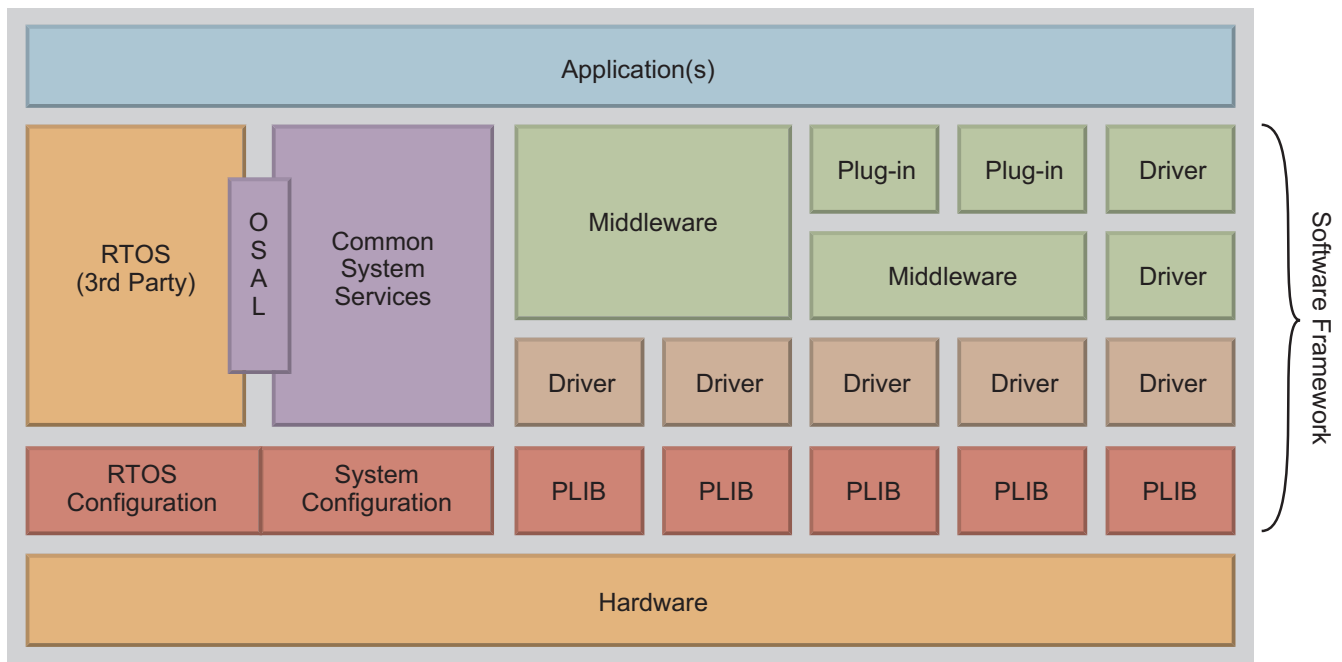
Additional software components planned

*Sold and front line support provided directly by Microchip



MICROCHIP

MPLAB Harmony Block Diagram



Application Layer

- Implements desired overall behavior
- Abstracted hardware access
- Allows for easy port across PIC32 parts

Common System Services

- Provides common functionality to avoid duplication and conflicts
- Eliminates complex interactions and interdependencies between modules
- OSAL provides OS compatibility and interface
- Manages shared resources
- Supports low-level configuration and board support package

Middleware Layer

- Implements complex libraries and protocols (USB, TCP/IP, file systems, graphics)
- Provides a highly abstracted application program interface
- Libraries are thread safe and RTOS ready
- Built on drivers, PLIBs, system services
- Supports third party library integration

Device Driver Layer

- Provides highly-abstracted interface to peripheral
- Controls access to the peripheral
- Manages multiple hardware instances and software clients with select drivers
- Manages peripheral state and multiple peripheral instances
- Accesses hardware via PLIB
- Supports blocking or non-blocking code

Peripheral Libraries (PLIB) Layer

- Provide functional interface for Microchip PIC32 scalability
- Implements part-specific features

Easy to Start • Easy to Develop • Easy Support



MICROCHIP

www.microchip.com/harmony

Visit our web site for additional product information and to locate your local sales office.

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