

Kinetis Thread Stack v.1.2.8 Release Notes

Supporting KW41Z

1 Overview

These are the release notes for the Kinetis Thread Stack software version 1.2.8 implementing a wireless IPv6 mesh network protocol for Internet of Things devices. The release notes are included in the software package for which they apply.

See nxp.com/thread and www.threadgroup.org for more information about the Thread wireless network technology.

See nxp.com/wireless for more information about NXP Thread supported platforms.

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2 Release Contents

The release contents are listed in the table below.

Table 1. Release Contents

Folder	Description
\middleware\wireless\nwk_ip_1.2.8\examples	Application source code, initialization and configuration files
\boards	Demo applications, driver examples, rtos examples and wireless application examples
\docs	Documents applying to the release
\boards\<board_type>\wireless_examples\thread\	Sample/demo projects for router eligible devices, end devices and host controlled device applications
\boards\<board_type>\wireless_examples\hybrid\	Sample/demo projects for Bluetooth Thread Router wireless UART, Bluetooth Thread Host Controlled Devices and Bluetooth 802.15.4 FSCI black box hybrid applications
\boards\<board_type>\wireless_examples\framework	Platform framework components
\tools\wireless\host_sdk	Thread Linux® OS Host Software (Python and C demos)
\boards\<board_type>\wireless_examples\ieee_802_15_4	IEEE® 802.15.4 MAC and PHY
\middleware\wireless\nwk_ip_1.2.8	Thread and network stack files
\devices	Platform linker configuration files for Thread applications
\tools\wireless	HostSDK, MyStarNetwork demo application, binary images, MAC/BLE/THREAD xml configuration files.
\rtos	Supported operating systems for the features included in the MKW41Z Connectivity Software package

3 Features Included

Kinetis Thread Stack 1.2.8 Release is a maintenance release for the KW41 platform.

The main features of this release are listed below.

- The stack provides Thread networking components over IEEE-802.15.4 MAC 2006 layer running on Kinetis MCUs which are enabled to use IEEE 802.15.4.
- The stack implements version 1.1.1 of the Thread Group core specification. The Thread stack has been [certified by Thread Group](#).
- The stack comes with application examples for implementing Thread Router Eligible Device, Thread End Device (including Low Power/Sleepy End Devices) and Thread Border Router, with application examples for implementing the Over-The-Air Updates in a Thread Large Network, with support for MCUXpresso IDE and IAR® Embedded Workbench. It contains also application examples for multimode Bluetooth (BLE) and Thread.
- The stack comes with application examples and a Host API to implement the host MCU scenario where the Kinetis wireless MCU running the Thread stack is hosted by an application processor running a high-level operating system such as Linux OS, Android™ platform, or Windows® OS.

4 What's New and Change Log

This section describes the major changes and new features implemented in the KW41Z Thread software releases:

4.1 MKW41Z Thread Software v1.2.8 (Thread lib v1.1.1.35)

- This version corresponds to a maintenance release of the MKW41Z Thread Software. Some of its major new features, compared to the previous Thread release on Kinetis MKW41Z wireless microcontrollers, include:
 - Thread Large Network stability improvements for Over-The-Air Updates
 - Thread bug fixes

4.2 MKW41Z Thread Software v1.2.8 (Thread lib v1.1.1.31)

- This version corresponds to a maintenance release of the MKW41Z Thread Software. Some of its major new features, compared to the previous Thread release on Kinetis MKW41Z wireless microcontrollers, include:
 - Thread bug fixes for Thread v1.1 certification
 - Stability improvements for long time running Thread large networks
 - Thread Sockets API updates

5 Software Deployment Considerations

- IAR Embedded Workbench for ARM® **v8.40.1** or MCUXpresso IDE **v11.0.0** are required to build the example projects included in this release and deploy the protocol stack libraries.
- Folder paths for projects must be kept short to account for a nested directory path limit. Otherwise, compilation errors referring to header files which cannot be found can arise.
- This release is compatible with the Test Tool for Connectivity Products **v12.8.6** or later. It is recommended to use the *ThreadIP_1.2.8.xml* file found in the *tools/wireless/xml_fsci* folder of this package or the Test Tool installation, with the Test Tool Command Console functionality to interact with the FSCI black box applications provided in this package. For more information, please refer *TTUG.pdf* included in the Test Tool installation.

6 Platform Considerations

The current release of Thread stack includes EWARm and MCUXpresso projects for the following platforms.

- FRDM-KW41Z
- USB-KW41Z

The Thread stack architecture is RTOS-agnostic. Sample applications in the current release use the FreeRTOS OS configurations.

7 Known Limitations

- This release supports only the IAR Embedded Workbench, the MCUXpresso toolchains and the FreeRTOS kernel. A bare metal (task scheduler only) system is not supported.
- Maximum file path length in Windows® 7 Operating System: "Windows OS 7 imposes a 260-character maximum length for file paths. When installing the release, please place it in a

directory close to the root, to prevent file paths from exceeding the maximum character length specified by Windows OS. The recommended location is the C:\NXP folder."

- The Thread Border Router application is available only for the usbkw41z_kw41z board type.
- One may experience a warning for "cmsis_iar.h" with IAR EWARM 8.22.x. The patch can be found on the IAR's My Pages.
- One may experience a warning for "Warning[Pa182]: bitwise operation drops significant bits from a constant" with IAR EWARM 8.30.1. This is a false warning and will be fixed in new IAR release.
- One may experience problems with MCUXpresso IDE v10.3.0 when importing more than one project from SDK. Workaround is to import just one project. The issue will be fixed in the future version.

8 Recommended Memory Configurations

The following are default memory configurations for the different Thread projects available in this release. The memory footprints provided below have been computed using Release project configurations and the IAR Embedded Workbench IDE.

- Thread border router (BR) default configurations:

MODULE	RAM [bytes]	Flash [bytes]
Application	6669	12543
Framework	34770	35018
Freertos	18080	5599
KSDK	208	8816
MAC/PHY	230	23358
Thread	16893	229242
TOTAL	76850	314576

- Thread router eligible end device (REED) default configurations:

MODULE	RAM [bytes]	Flash [bytes]
Application	6141	11587
Framework	22761	35641

Freertos	17056	5556
KSDK	208	8555
MAC/PHY	230	23370
Thread	12978	206080
TOTAL	59374	290789

- Thread end device (ED) default configurations:

MODULE	RAM [bytes]	Flash [bytes]
Application	2289	10410
Framework	12861	35588
Freertos	11424	5556
KSDK	208	8554
MAC/PHY	226	19716
Thread	4978	148278
TOTAL	31986	228102

- Thread low power end device (LPED) default configurations:

MODULE	RAM [bytes]	Flash [bytes]
Application	2162	8632
Framework	12628	31533
Freertos	11424	5556
KSDK	208	7019
MAC/PHY	226	19716

Thread	5253	128990
TOTAL	31901	201446

- BLE Thread Host Controlled Device default configurations:

Application	8527	11713
BLE Controller	1850	43373
BLE Host	3924	92011
Framework	37754	38643
Freertos	11424	5556
KSDK	208	8554
MAC/PHY	231	23915
Thread	14124	216059
TOTAL	78042	439824

- BLE Thread Router Wireless UART default configurations:

MODULE	RAM [bytes]	Flash [bytes]
Application	8927	18203
BLE Controller	1850	43376
BLE Host	3755	68771
Framework	31965	41480
Freertos	18080	5556
KSDK	208	8554
MAC/PHY	231	23917
Thread	12978	206152

TOTAL	77994	416009
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9 Revision History

This table summarizes revisions to this document.

Table 2 Revision history		
Revision number	Date	Substantive changes
0	09/2016	Initial release
1	04/2017	Updates for the KW41 MCUX GA release
2	01/2018	Updates for KW41 Maintenance Release
3	08/2018	Updates for KW41 Maintenance Release1
4	01/2019	Updates for KW41 Maintenance Release2
5	03/2019	Updates for KW41 Maintenance Release3
6	08/2019	Updates for KW41 MR3.1

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