



# **Application Note: Upgrading To Z-Stack v2.1.0**

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## 1. Purpose

This document describes considerations to make when upgrading to Texas Instruments Z-Stack™ version v2.1.0, discussing changes made since the v2.0.0 release of Z-Stack. Primarily, changes have been made to support the ZigBee Smart Energy specification, introduction of Over Air Download (OAD) support for MSP430 platforms, and introduction of support for the CC2591 PA/LNA device. This document discusses changes to the “core” (*ZStack-MSP2618-2.1.0.exe*) and the “full” (*ZStack-MSP2618-2.1.0-1.2.0.exe*) packages.

## 2. Details of Changes

### 2.1 ZigBee Smart Energy Support

Z-Stack now includes support for the ZigBee Alliance Smart Energy Profile Specification. This includes ZigBee Cluster Library (ZCL) key establishment clusters and secure joining support, as well as, new Smart Energy defined clusters, and InterPAN transmission. Refer to the “Z-Stack Smart Energy API” document for details on developing a Smart Energy application. Refer to Section 10.5 of the “ZigBee Developer’s Guide” document for details on secure joining.

### 2.2 Inter-PAN Communication

Inter-PAN communication allows ZigBee devices to perform limited (no security) exchange of information with devices in their local neighborhood without having to join the same ZigBee network. This feature was introduced for the Smart Energy Profile but has been provided as a general Z-Stack feature. Refer to Section 12 of the “Z-Stack Developer’s Guide” document for details on use of the Inter-PAN feature. See Section 3.4.1.6 of the “Z-Stack API” document for details on functions provided to support Inter-PAN communication.

### 2.3 CC2591 PA/LNA Support

Z-Stack now provides support for the Texas Instruments CC2591 PA/LNA range extender device. The CC2591 increases the link budget by providing a PA for improved transmit output power and a LNA for improved receiver sensitivity. Refer to Section 10 of the “HAL Driver API” document for details on using an external CC2591 device.

### 2.4 Over Air Download Support

This release extends support of the Z-Stack Over Air Download (OAD) feature to MSP430 platforms. Z-Stack’s OAD is an extended feature that provides a mechanism for program upgrades of deployed ZigBee devices without the need for physical access to the device. Refer to the “OverAir Download for MSP430” document for details on the implementation and usage of OAD-enabled devices.

### 2.5 OSAL Timer Optimization

The OSAL Timer system has been upgraded to eliminate its use of a dedicated hardware timer. In addition to giving the user access to an additional hardware timer, OSAL time processing is more accurate by eliminating the problem of missed timer interrupts during heavy system operation. OSAL Timer is now uses the OSAL\_Clock mechanism, which derives its updates from the TIMAC clock tick.

### 2.6 Changes to Installed Files

Refer to the tables in Sections 2.6.1 and 2.6.2 for file changes to the “core” and “full” installers, respectively. Pay particular attention to items with **NEW** or **REMOVED** in the **Change** column. Folder updates are indicated when there is no entry in the **File** column. Changes to project files (\*.ewp and \*.ewd) can be made with the IDE or by editing the project files directly.

#### 2.6.1 Changes to “Core” Installed Files

The following “core” Z-Stack files have been changed since the v2.0.0 release:

File	Location	Change
hal_assert.c	...\Components\hal\common	Modified
hal_drivers.c	...\Components\hal\common	Modified

hal_ccm.h	...Components\hal\include	Modified
hal_oad.h	...Components\hal\include	NEW
hal_xnv.h	...Components\hal\include	NEW
hal_board_cfg.h	...Components\hal\target\MSP2618CC2520	Modified
hal_ivec.s43	...Components\hal\target\MSP2618CC2520	NEW
hal_lcd.c	...Components\hal\target\MSP2618CC2520	Modified
hal_mac_cfg.c	...Components\hal\target\MSP2618CC2520	Modified
hal_mac_cfg.h	...Components\hal\target\MSP2618CC2520	Modified
hal_oad.c	...Components\hal\target\MSP2618CC2520	NEW
hal_timer.c	...Components\hal\target\MSP2618CC2520	Modified
hal_uart.c	...Components\hal\target\MSP2618CC2520	Modified
hal_xnv.c	...Components\hal\target\MSP2618CC2520	NEW
mac_pib.c	...Components\mac\high_level	Modified
mac_radio.c	...Components\mac\low_level\srf04	Modified
mac_rx.c	...Components\mac\low_level\srf04	Modified
mac_dualchip.c	...Components\mac\low_level\srf04\dual_chip	Modified
mac_dualchip.h	...Components\mac\low_level\srf04\dual_chip	Modified
mac_dualchip_tx.c	...Components\mac\low_level\srf04\dual_chip	Modified
mac_dualchip_tx.h	...Components\mac\low_level\srf04\dual_chip	Modified
mac_mcu_timer.c	...Components\mac\low_level\srf04\dual_chip	Modified
mac_radio_defs.c	...Components\mac\low_level\srf04\dual_chip	Modified
mac_radio_defs.h	...Components\mac\low_level\srf04\dual_chip	Modified
MT.c	...Components\mt	Modified
MT.h	...Components\mt	Modified
MT_MAC.c	...Components\mt	Modified
MT_SYS.c	...Components\mt	Modified
OSAL.c	...Components\osal\common	Modified
OSAL_Clock.c	...Components\osal\common	Modified
OSAL_Timers.c	...Components\osal\common	Modified
OSAL_Clock.h	...Components\osal\include	Modified
OSAL_Timers.h	...Components\osal\include	Modified
ZComDef.h	...Components\osal\include	Modified
MSP430FlashUtil.c	...Components\osal\mcu	Modified
MSP430FlashUtil.h	...Components\osal\mcu	Modified
OSAL_Nv.c	...Components\osal\mcu	Modified
AF.c	...Components\stack\af	Modified
APSMEDe.h	...Components\stack\nwk	Modified
aps_frag.c	...Components\stack\nwk	Modified
stub_aps.c	...Components\stack\nwk	Modified
stub_aps.h	...Components\stack\nwk	Modified
ZGlobals.h	...Components\stack\sys	Modified
ZDApp.c	...Components\stack\zdo	Modified
ZDProfile.c	...Components\stack\zdo	Modified
ZDSecMgr.c	...Components\stack\zdo	Modified
ZDSecMgr.h	...Components\stack\zdo	Modified
802.15.4 MAC API	...Documents	Modified
HAL Driver API	...Documents	Modified
Migrating Application from 1.4.X	...Documents	REMOVED
OSAL API	...Documents	Modified
Upgrading To Z-Stack v2.1.0	...Documents	NEW
Z-Stack API	...Documents	Modified
Z-Stack Compile Options	...Documents	Modified
Z-Stack Developer's Guide	...Documents	Modified
Z-Stack User's Guide	...Documents\MSP2618	Modified

EndDevice2618.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
EndDevice2618-Pro.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
EndDevice2618MT.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
EndDevice2618MT-Pro.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
Router2618.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
Router2618-Pro.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
Router2618MT.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
Router2618MT-Pro.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
Security2618.lib	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	Modified
TIMAC-MSP4618.lib	...\\Projects\\zstack\\Libraries\\TIMAC\\bin	Modified
f8wConfig.cfg	...\\Projects\\zstack\\Tools\\MSP2618	Modified
MSP430F2618.xcl	...\\Projects\\zstack\\Tools\\MSP2618	Modified
OnBoard.c	...\\Projects\\zstack\\Tools\\ZMain	Modified
OnBoard.h	...\\Projects\\zstack\\Tools\\ZMain	Modified

## 2.6.2 Changes to “Full” Installed Files

In addition to the “core” installer file changes listed in Section 2.6.1, the following Z-Stack “full” installer files have been changed since the v2.0.0 release:

File	Location	Change
zcl.c	...\\Components\\stack\\zcl	Modified
zcl.h	...\\Components\\stack\\zcl	Modified
zcl_closures.c	...\\Components\\stack\\zcl	Modified
zcl_general.c	...\\Components\\stack\\zcl	Modified
zcl_hvac.c	...\\Components\\stack\\zcl	Modified
zcl_key_establish.c	...\\Components\\stack\\zcl	<b>NEW</b>
zcl_key_establish.h	...\\Components\\stack\\zcl	<b>NEW</b>
zcl_general.c	...\\Components\\stack\\zcl	Modified
zcl_lighting.c	...\\Components\\stack\\zcl	Modified
zcl_ms.c	...\\Components\\stack\\zcl	Modified
zcl_se.c	...\\Components\\stack\\zcl	<b>NEW</b>
zcl_se.h	...\\Components\\stack\\zcl	<b>NEW</b>
zcl_ss.c	...\\Components\\stack\\zcl	Modified
Application-Level Tuning	...\\Documents	Modified
Method for Discovering Network	...\\Documents	Modified
Z-Stack Smart Energy API	...\\Documents	<b>NEW</b>
Z-Stack ZCL API	...\\Documents	Modified
Over Air Download for MSP430	...\\Documents\\MSP2618	<b>NEW</b>
SampleLight.ewp	...\\Projects\\zstack\\HomeAutomation\\SampleLight\\CC2520DB	Modified
ecc.r43	...\\Projects\\zstack\\Libraries\\MSP2618\\bin	<b>NEW</b>
GenericApp.ewp	...\\Projects\\zstack\\Samples\\GenericApp\\CC2520DB	Modified
	...\\Projects\\zstack\\Samples\\SE	<b>NEW</b>
	...\\Projects\\zstack\\Samples\\SE\\Source	<b>NEW</b>
se.c	...\\Projects\\zstack\\Samples\\SE\\Source	<b>NEW</b>
se.h	...\\Projects\\zstack\\Samples\\SE\\Source	<b>NEW</b>
oad.exe	...\\Projects\\zstack\\Tools\\MSP2618	<b>NEW</b>
oad_preamble.h	...\\Projects\\zstack\\Tools\\MSP2618	<b>NEW</b>
oad.xcl	...\\Projects\\zstack\\Tools\\MSP2618	<b>NEW</b>
SerialApp.ewp	...\\Projects\\zstack\\Utilities\\SerialApp\\CC2520DB	Modified
TLCommonLib.dll	...\\Tools\\Z-Tool	Modified
TLZCmdMatchings.dll	...\\Tools\\Z-Tool	Modified
TLZPL.dll	...\\Tools\\Z-Tool	Modified

TI.ZPI.xml	...\Tools\Z-Tool	Modified
TI.ZPortLib.dll	...\Tools\Z-Tool	Modified
TI.ZScript.dll	...\Tools\Z-Tool	Modified
ZPI Help.chm	...\Tools\Z-Tool	Modified
Z-Tool 2.0.exe	...\Tools\Z-Tool	Modified
Z-ToolHelp.chm	...\Tools\Z-Tool	Modified